DOCUMENT RESUME

ED 187 299 IR 008 240

AUTHOR	Lucas, William A.; Adams, William C.
TITLE	An Assessment of Telephone Survey Methods.
INSTITUTION	Rand Corp., Santa Monica, Calif.
SPONS AGENCY	National Science Foundation, Washington, D.C.
REPORT NO	Rand-R-2135-NSF
PUB DATE	Oct 77
CONTRACT	SOC76-14845
NOTE	73p.
AVAILABLE FROM	Rand Corp., Santa Monica, CA 90406 ($5.00)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Evaluation Methods; Interviews; *Research Methodology; *Sampling; *Surveys; Tables (Data); *Telephone Communications Industry

ABSTRACT

This report documents a methodological study conducted for the National Science Foundation to investigate the effects of different media environments on relationships between local television news viewing and local knowledge. The study serves two purposes: it establishes the reliability of data collected in an investigation by Rand of the effects of local media in seven western Pennsylvania cities and records the methodology used in that investigation; and it contributes to a general understanding of the strengths and weaknesses of telephone surveys for studying political and communications behavior. A review of the relevant literature, which was the basis for the original research implemented by Rand, indicated that the telephone was the preferred means of collecting data on citizen media use and political knowledge. (Author/JEG)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED187299

AN ASSESSMENT OF TELEPHONE SURVEY METHODS

PREPARED UNDER A GRANT FROM THE NATIONAL SCIENCE FOUNDATION

This report was prepared with the support of National Science Foundation Grant No. SOC76-14845. Any opinions, findings, conclusions, or recommendations expressed herein are those of the authors and do not necessarily reflect the views of the National Science Foundation.

WILLIAM A. LUCAS, WILLIAM C. ADAMS

R-2135-NSF
OCTOBER 1977

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
Rand Corp.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

$5.00

Rand
SANTA MONICA, CA. 90406

Published by The Rand Corporation

IR008240

PREFACE

This report stems from a concern about the effects of local television news in major metropolitan markets. Earlier Rand research had found that local television news viewing related to local knowledge differently in central cities than in the suburbs (W. A. Lucas and K. B. Possner, *Television News and Local Awareness: A Retrospective Look*, R-1858-MF, October 1975). A theory of the effects of different media environments was subsequently developed, and seven cities in western Pennsylvania were selected for study because they represented the media contexts of theoretical interest within the same state. After a review of the relevant literature, it was concluded that the telephone was on balance the preferred means of collecting data on citizen media use and political knowledge. Rand then submitted a proposal to the Political Science program of the National Science Foundation for funds to carry out the research.

When NSF had the proposal reviewed, it found sharp division among professionals in the survey research community. While the telephone has become widely used in marketing research, some social scientists in academic circles continue to doubt the validity of data collected by telephone. The outcome was that Rand was funded to conduct the news media study, including a methodological study of the relative validity of personal and telephone surveys within the broader investigation.

This report documents the methodological study conducted for NSF. It serves two purposes. It establishes the reliability of the data collected in Rand's investigation of the effects of local media in the seven western Pennsylvania cities, and records the methodology used in that investigation. At the same time, it contributes to a general understanding of the strengths and weaknesses of telephone surveys for studying political and communications behavior.

FEB 1 3 1980

SUMMARY

Criticism of telephone surveys has focused on biases that could result in the sample obtained by telephone and in answers elicited over the telephone. In the past, telephones were a biased way of securing general population data because large numbers of disadvantaged families could not afford them. Recent research suggests, however, that by 1976 saturation was so high that the exclusion of non-telephone households was no longer a liability for telephone survey sampling in most parts of the country.

Available techniques of random-digit and added-digit dialing are shown to provide representative samples of telephone households. The difficult trade-off in the design of telephone sampling procedures is the choice between complex systems that maximize the representativeness of within-household selections, and short systems of within-household respondent selection procedures that minimize refusals. Data collected in western Pennsylvania are used to illustrate the impact of the joint effects of sampling telephone households, added-digit dialing, within-household selection procedures, refusal rates, and other factors which might affect the sampling power of telephone surveys. Estimates of population characteristics obtained by telephone and personal surveys in seven western Pennsylvania cities were compared to Census data, voting registration and turnouts, and other available data. Telephone survey estimates for each city were acceptable representations of the adult populations. When the results in the two cities where both telephone and personal surveys were conducted were compared, the personal sample was somewhat less representative of the population due to its cluster structure.

Most observers agree that accurate data can be collected by telephone when it does not involve questions the respondent considers sensitive. Concern has focused on respondent willingness to report sensitive information and bias due to social desirability. A review of the literature and data from the the two Pennsylvania cities where comparative telephone and personal interviews were collected support the view that respondents are willing to provide detailed and personal information on a variety of personal topics over the telephone that is comparable to that obtained in person. In addition, telephone interviewing may lead to slight reductions in socially desirable and presumably less distorted answers, although the effects are fairly subtle.

Further comparative analysis of the personal and telephone interviews found a few differences which appeared to be associated with complexity of the questions and the pacing of interviews. The problems posed by complex questions, coupled with the faster pace of telephone interviews, may be more important issues for telephone surveys than subject matter sensitivity.

Centralized telephone interviewing was found to offer many opportunities for improving quality control over the survey data. Quality control, along with the sampling and response findings, means that telephone interviewing does not have to be justified by virtue of its substantially lower costs. For many purposes, it is competitive or superior to personal interviewing.

Findings from the Pennsylvania surveys were consistent with a growing body of research which support the conclusion that telephone surveys can provide repre-

sentative samples of the general population and can obtain reliable answers on sensitive as well as factual subjects. The telephone survey does as well as the personal survey for most purposes and has greater potential for quality and flexibility at lower cost.

ACKNOWLEDGMENTS

The collection of data for this report would not have been possible without the cooperation and counsel of the Opinion Research Corporation. We are especially grateful to the following for their support and assistance: E. Cowan; S. Honeycutt and her interview staff; T. Stack; R. Toothman, research director for the project for ORC; and S. Hunter and the field staff of Data Insights in Pittsburgh.

Useful criticisms and suggestions based on earlier drafts of this report were offered by S. Berry, Z. Blum-Doering, D. Hensler, and L. Johnson at Rand.

CONTENTS

PREFACE iii

SUMMARY v

ACKNOWLEDGMENTS vii

Chapter

1. INTRODUCTION 1
   - Are Telephone Households Representative? 1

2. SAMPLING ISSUES AND TELEPHONE SURVEYS 6
   - The Telephone Directory and Unlisted Numbers 6
   - Probability Sampling Techniques for Telephone Surveys 7
   - Selecting and Obtaining Within-Household Respondents 8
   - Refusals 11
   - Sampling Precision in Five City Telephone Surveys 12
   - Personal Interviews and Cluster Sampling 15
   - Comparative Survey Methodologies: The Bethel Park and Wilkinsburg Samples 16

3. TELEPHONE SURVEY RESPONSE RELIABILITY 22
   - Early Research on Reliability 22
   - Reliability of Sensitive Questions 23
     - A Comparison of Income Responses by Survey Methods 27
   - Social Desirability in Survey Responses 29
     - Comparative Responses to Political Attentiveness Questions 30
   - Question Structure and Pacing Effects 31
   - Question Structure not Subjects 36

4. QUALITY IMPLICATIONS OF SURVEY ADMINISTRATION 38
   - Flexibility and Quality Control 39
     - Mimimizing Interviewer Obtrusiveness and Bias 39
     - Question Administration and Monitoring 39
   - Cost 41
   - Conclusions 43
     - Looking Forward 43

Appendix

A. THE PENNSYLVANIA SURVEYS OF MEDIA EFFECTS 45

B. MASTER QUESTIONNAIRE FOR THE 7 PENNSYLVANIA TELEPHONE SURVEYS 50

Bibliography: Telephone Survey Methods 63

1. INTRODUCTION

Despite the steady growth and widespread use of telephone surveys in commercial marketing, many academic researchers have continued to view that methodology with suspicion. The reasons for this reluctance are varied, but they can be broadly grouped into three categories. Bias in data collected by telephone could potentially result (1) from the use of telephone households rather than all households as a sampling universe, (2) from bias in the selection of a sample of telephone households due to unlisted telephone numbers, (3) from refusals during the process of contacting and gaining respondents' cooperation, and (4) from limitations on the questions that can be asked and the reliability of answers elicited over the telephone. If any of these sources of error contaminate the data, the results would not be an accurate representation of the characteristics of the population under examination.

This section treats the first—and most telling—of these criticisms, the charge that telephone households are not representative of the population. As the data will show, this view has been correct but it is no longer true today. The second section will treat issues of telephone sampling procedures, refusal rates, and within-household selection procedures to show that proper telephone survey methods can provide an acceptable sample. The third section will treat the reliability of responses given by telephone and through personal interviews to show what can, and what cannot, be asked by telephone. The conclusion will treat issues of cost and management of telephone surveys, and discuss the general value of the telephone survey for research.

ARE TELEPHONE HOUSEHOLDS REPRESENTATIVE?

Historically, telephone interviewing has been a very biased way of securing general population data because large numbers of disadvantaged families could not afford telephone service. Even as recently as 1960, fewer than 75 percent of all households had telephones and the distribution was highly correlated with economic status. Fewer than half the families with income under $2,000 had telephones compared to 96 percent among those earning between $15,000 and $25,000.[1] During the 1960s and early 1970s, however, the telephone came to be virtually ubiquitous. Recent research suggests that by 1976 saturation was so high that the exclusion of non-telephone households was no longer a liability for telephone survey sampling in most parts of the country.

Prior to the 1970s, studies of the distribution of telephone households were usually pessimistic about the problems of telephone samples. Schmiedeskamp reported considerable differences in the characteristics of households with and without telephones.[2] Homes without telephones constituted 26 percent of the American

[1] U.S. Census Bureau, "Characteristics of Households with Telephones, March 1965," *Current Population Reports*, Series P-20, No. 146, December 1965.

[2] Jay W. Schmeideskamp, "Reinterviews by Telephone," *Journal of Marketing*, Vol. 26, January 1962, pp. 28-34.

population in the 1959 University of Michigan Survey Research Center sample. Table 1 shows the extent of major differences in the socioeconomic status of the two groups. Over half those without telephones had family incomes of under $3,000, while only 19 percent of those with telephones were in the low income bracket.

Table 1

1959 CHARACTERISTICS OF TELEPHONE OWNERS AND NON-OWNERS

Respondent Characteristics	Telephone Owners	Telephone Non-Owners
Family Income:		
Less than $3,000	19%	52%
$3,000 — $4,999	25	31
$5,000 — $7,499	30	14
$7,500 and over	26	3
Education:		
Grade school or less	29	52
At least some high school	45	40
At least some college	26	8

SOURCE: Schmiedeskamp (1962), p. 29, University of Michigan, Survey Research Center 1959 Survey.

By 1965, growth in the number of telephones had reduced the disparity, though there were still important distinctions between the 81 percent of all households with telephones and the 19 percent without telephones. A Census Bureau study that year,[3] which has never been updated, documented the differences shown in Table 2. Over 95 percent of those with incomes over $10,000 had telephones, while from one-half to three-fourths of those earning less than $5,000 had telephones. The median income in the preceding year for primary families with telephone was $7,281, while that of those without telephones was only $3,386. There was a comparable disparity for primary individuals (those living alone or with non-relatives).[4]

As a result, telephone surveys as late as the mid-1960s were likely to have a serious sampling bias. For example, Kegeles, Fink, and Kirscht sought to reinterview by telephone a known group of 744 people in 1964.[5] The group was composed of about half of the original respondents to an earlier national survey conducted through personal interviews. Those that could be reached for the reinterview by telephone (n=542) overrepresented white, middle and upper income, urban and non-South, and highly educated individuals. The relative absence of the telephone in poor, black, and Southern homes was reflected in sample bias.

By 1970, the proportion of the population with telephones had come to reflect substantially the demography of the entire population. Using data from the 1970

[3] U. S. Census Bureau, 1965, op. cit.

[4] For further discussions of the 1965 Census Bureau report see Ingrid C. Kildegaard, "Telephone Trends," *Journal of Advertising Research*, Vol. 6, June 1966, pp. 56-60; and Joseph B. Perry Jr., "A Note on the Use of Telephone Directories as a Sample Source," *Public Opinion Quarterly*, Vol. 32, Winter 1968-69, pp. 691-69.

[5] S. Stephen Kegeles, Clinton F. Fink and John P. Kirscht, "Interviewing a National Sample by Long Distance Telephone," *Public Opinion Quarterly*, Vol. 33, Fall 1969, pp. 412-419.

Table 2

PERCENT OF HOUSEHOLDS WITH TELEPHONES BY INCOME: 1960 AND 1965

Total Money Income of Primary Families and Individuals	1965 Percent with Telephone	1960 Percent with Telephone	1960-1965 Change Percent with Telephone
Under $1,000	55.7	43.5	+12.2
$1,000 to $1,999	61.5	50.3	+11.2
$2,000 to $2,999	66.7	57.0	+ 9.7
$3,000 to $3,499	70.7	66.1	+ 4.1
$3,500 to $3,999	73.4	65.9	+ 7.5
$4,000 to $4,499	74.3	72.8	+ 1.5
$4,500 to $4,999	76.5	76.8	- 0.3
$5,000 to $5,999	80.7	82.8	- 2.1
$6,000 to $6,999	85.9	86.4	- 2.4
$7,000 to $9,999	92.7	92.4	+ 0.3
$10,000 to $14,999	95.6	95.0	+ 0.6
$15,000 to $24,999	96.2	96.0	+ 0.2
$25,000 and over	95.4	92.9	+ 2.5

SOURCE: Census Bureau (1965), p. 5.

Census, Tuchfarber and Klecka tabulated and compared characteristics of households with a telephone available to all households nationwide using data from the "1 in 10,000 Public Use Sample."[6] The 87 percent of all 1970 households with a telephone available was closely converging with the demographic traits of all U.S. households (Table 3).

Then by 1976, the share of the population with telephones came even closer to mirroring the entire national population in terms of household income, education, race and other demographic measures. The 1976 Law Enforcement Assistance Administration's National Crime Survey revealed that the socioeconomic differences between telephone and non-telephone homes had all but disappeared. Based on personal interviews in 10,043 households in January 1976, the survey found that differences in income and education were 2 percent or smaller. As illustrated in Table 3, household income, education and other variables closely approached the same levels for total households and telephone households.

To be sure, there are still limits on obtaining samples of some populations. A few pockets around the country are not yet saturated with telephones—notably Mississippi, with 76 percent of all households with telephones in 1972. But the trend is unmistakable and sharply upward even in these areas. If a survey is exclusively targeted on a subgroup known to have somewhat fewer telephones, differences that are relatively trivial for a general survey take on major importance for the study of a smaller group. Taking the very poor for an example,[7] a difference of 2.1 percent of the total population becomes a bias of 15 to 20 percent if poverty households were the sole focus of the study. There remains, however, no substantive reason not to

[6] Alfred J. Tuchfarber and William R. Klecka, *Random Digit Dialing: Lowering the Cost of Victimization Surveys*, Police Foundation, Washington, D.C., 1977.

[7] A 1975 reported household income under $3,000.

Table 3

CHARACTERISTICS OF HOUSEHOLDS WITH A TELEPHONE AVAILABLE VERSUS ALL HOUSEHOLDS NATIONWIDE: 1970 AND 1976

Household Characteristics by Year	Percentage		
	Telephone	All	Difference
1970:[a]			
Household Income			
Less than $3,000	14.3	16.7	- 2.4
$3,000 — $7,499	26.9	29.1	- 2.2
$7,500 — $9,999	15.2	14.8	+ 0.4
$10,000 — $14,999	24.7	22.7	+ 2.0
$15,000 — $24,999	14.6	13.0	+ 1.6
$25,000 or more	4.2	3.7	+ 0.5
Race of Head			
White and other	91.8	89.7	+ 2.1
Black	8.2	10.3	- 2.1
Education of Head			
0 — 8 years	24.1	26.8	- 2.7
9 — 12 years	47.4	47.1	+ 0.3
More than 12 years	28.5	26.1	+ 2.4
1976:[b]			
Household Income			
Less than $3,000	9.3	11.4	- 2.1
$3,000 — $7,499	24.3	26.2	- 1.9
$7,500 — $9,999	12.8	12.8	0.0
$10,000 — $14,999	24.9	23.4	+ 1.5
$15,000 — $24,999	21.4	19.7	+ 1.7
$25,000 or more	7.2	6.5	+ 0.7
Race of Head			
White and other	90.8	89.5	+ 1.2
Black	9.2	10.4	- 1.2
Education of Head			
0 — 8 years	19.5	21.0	- 1.5
9 — 12 years	45.1	45.4	- 0.3
More than 12 years	35.4	33.6	+ 1.8

[a]SOURCE: Tuchfarber and Klecka, 1976, p. 24; 1970 U.S. Census, 1 in 10,000 Public Use Sample tape.

[b]SOURCE: Tuchfarber and Klecka, 1976, p. 26; LEAA National Crime Survey, January 1976 panel, p. 26; based on 10,043 interviewed households.

presume that telephone households provide an unbiased pool from which to sample for general population surveys.

As can be seen from the data presented here, the view that telephone households are not representative of the general population was accurate as recently as the 1960s, but the spread of the telephone into low-income homes has outdated that criticism. For most purposes, the evidence that the universe of telephone households is an acceptable representation of all households is now rather compelling. It is therefore appropriate to consider in turn the other criticisms of the telephone survey—its sampling procedures and the reliability of telephone data.

To accomplish this task, the report will both review the available literature on telephone interviewing and draw upon 3,042 interviews in seven western Pennsylvania cities. Part of a study of the mass media and political awareness, these data include between 400 and 500 telephone interviews in each of five cities. In the two remaining cities, the survey was conducted both by telephone and by personal interviews in respondents' homes, and allows a comparative assessment of telephone and in-person interviews. The three sections which follow will consider sampling issues, comparative telephone and personal survey responses, and some management issues relating to quality control. The general format of the study is to first review the literature on these issues and then to analyze the relevant Pennsylvania survey data.

2. SAMPLING ISSUES AND TELEPHONE SURVEYS

All survey methodologies must find ways to obtain representative samples. Without a complete and current listing of the entire population, a pure random sample cannot be obtained. Consequently, one must rely on a series of approximations and pragmatic compromises to obtain a probability sample. It is important, therefore, to examine the practical steps that are taken in drawing and obtaining a telephone survey sample, and to consider their cumulative effect in providing a representative sample. Since the record shows that techniques such as area probability sampling for personal surveys of households have achieved generally representative samples, it is also instructive to contrast the relative strengths and weaknesses of these two survey methods.

First, we shall review the sampling procedures involved in obtaining a telephone sample, including the development of a sampling frame, the choice of households, within-household selection, and refusal rates. Telephone survey data collected in western Pennsylvania will be used to show the cumulative effects of these procedures on sample bias. Then to compare area probability sampling and random-digit dialing, we shall touch briefly on the major differences in the procedures employed and, again using western Pennsylvania data, show the comparative, cumulative results.

THE TELEPHONE DIRECTORY AND UNLISTED NUMBERS

While telephone households have come to closely reflect the characteristics of the population as a whole, households listed in telephone directories are less representative because of unlisted numbers. Directories provide biased samples, and the problem has gotten worse rather than better since the 1960s as large proportions of telephone users choose not to list their numbers in the directory. In addition to numbers unlisted by choice, the high mobility of the American population means many new telephone numbers are operational but not included in current published directories. In one study, Cooper learned that up to 18 percent of the total subscribers in Cincinnati were not listed—6 percent by request and 12 percent because their telephone had been installed since the last directory was issued.[1] An unpublished Illinois Bell study showed that 20 percent of all Chicago customers were not listed.[2] In a study of Toledo subscribers, Brunner and Brunner found 13 percent were voluntarily unlisted.[3] They went on to contrast the characteristics of households which were listed with those which were voluntarily unlisted, and found several modest but significant differences. Unlisted subscribers tended to be somewhat younger, less affluent, less educated, more in blue-collar occupations

[1] Sanford L. Cooper, "Random Sampling by Telephone—An Improved Method," *Journal of Marketing Research*, Vol. 1, November 1964, pp. 45-48.

[2] Cited in Robert C. Judd, "Telephone Usage and Survey Research," *Journal of Advertising Research*, Vol. 6, December 1966, pp. 38-39.

[3] James A. Brunner and G. Allen Brunner, "Are Voluntarily Unlisted Telephone Subscribers Really Different?" *Journal of Marketing Research*, Vol. 8, February 1971, pp. 121-124.

than were listed subscribers. A subsequent study of the Toledo area replicated these findings and found some media habits differed between listed and unlisted subscribers.[4] Leuthold and Scheele's survey in Missouri supported these findings, but also found a strong propensity toward unlisted numbers among blacks. They also found that city dwellers were more likely to be unlisted and unlisted numbers were also relatively more likely among younger people, union members, and apartment renters.[5]

National data on the demography of unlisted numbers also found similar racial and economic differences. Glasser and Metzger reported on four national telephone surveys which reached respondents by random-digit dialing and asked, "Is your telephone number listed in the current telephone directory?"[6] They found that the national rate of non-listed phones was close to 19 percent. Non-whites were twice as likely as whites not to have listed telephones. Nationally, urbanized areas had more non-listed residential telephones (24-29%) than did small and rural counties (9-16%). However, "contrary to popular belief, the lower and the highest income groups consistently showed lower than average incidence of non-listed households."[7] The middle income group ($5,000 to $9,999) consistently had the highest proportion of telephones that were not listed. As in their 1972 report,[8] Glasser and Metzger found numbers were listed less frequently in the West and among younger people (ages 18-34). Blankenship reported that surveys conducted by three large reseach firms indicated especially high proportions of unlisted telephones were likely among households in the West, in large metropolitan areas, with younger heads, and in middle and lower middle income brackets ($5,000 to $15,000).[9] The research findings concur that listed telephones are unlikely to be representative of all telephone subscribers and that some alternative is necessary to obtain a sample of telephone households.

PROBABILITY SAMPLING TECHNIQUES FOR TELEPHONE SURVEYS

Since dialing numbers listed in the directory leads to a biased sample, numbers must be generated in a manner which includes a representative proportion of unlisted telephones.[10] To dial seven-digit random numbers would be wasteful because thousands of not-in-service telephone numbers would be called. Surveys can take advantage of the fact that telephone numbers are assigned by three-digit exchanges and, within exchanges, consecutively within blocks of 1,000.

[4] Sydney Roslow and Laurence Roslow, "Unlisted Phone Subscribers are Different," *Journal of Advertising Research*, Vol. 7, August 1972, pp. 35-38.

[5] David A. Leuthold and Raymond Scheele, "Patterns of Bias in Samples Based on Telephone Directories," *Public Opinion Quarterly*, Vol. 35, Summer 1971, pp. 249-257.

[6] Gerald J. Glasser and Gale D. Metzger, "National Estimates of Nonlisted Telephone Households and Their Characteristics," *Journal of Marketing Research*, Vol. 12, August 1975, pp. 359-361.

[7] Ibid., p. 360.

[8] Gerald J. Glasser and Gale D. Metzger, "Random-Digit Dialing as a Method of Telephone Sampling," *Journal of Marketing Research*, Vol. 9, February 1972, pp. 59-64.

[9] A. B. Blankenship, "Listed versus Unlisted Numbers in Telephone-Survey Samples," *Journal of Advertising Research*, Vol. 17, February 1977, pp. 39-46.

[10] One exception would be an exclusively rural and small town survey where unlisted phones are under 5 percent; the small decrease in bias from random dialing would probably not be worth the savings of using the directory.

Using the exchanges as a starting point, one approach to random-digit dialing involves generating four random numbers to add to the exchanges in an area. A modification of this approach is more efficient since many exchanges do not use all ten blocks and there is no point in randomly generating thousands of telephone calls to blocks not in service. Given that unlisted numbers are usually distributed throughout all exchanges and blocks, the directory should provide a valid source of operating exchanges and blocks weighted by the proportion of telephones located in each exchange and block. Thus three random numbers are inserted onto a three-digit exchange and one-digit working "block". A number (781-2436) is drawn, the exchange and block retained (781-2), three random digits generated (799), and added to the original stem to get a number to be called (781-2799).[11]

One further variation of the random-digit approach will be referred to as "added-digit dialing." This method takes residential telephone numbers from the directory at regular intervals. Onto these seed numbers are added one or more constants to the last digit so that each directory number generates one or more new numbers for the sample.[12] Banks of numbers are thus self-weighting, and if there are fewer numbers within a bank, it is less likely to be drawn. Unused banks are never chosen or dialed.

Added-digit dialing poses two potential problems. In rapidly growing cities, whole new banks may be opened up after publication of directories. A system relying on the directory for the first several digits would omit these new telephone homes. Mobile and new residents in the community would then be underrepresented. Also, in instances where unlisted numbers may be grouped together rather than distributed randomly throughout exchanges, added-digit dialing would underrepresent such numbers. Social scientists can usually obtain estimates about the magnitude of these problems from local telephone companies. In the Pennsylvania survey neither of these problems were found. Telephone company officials confirmed that unlisted phones were evenly distributed throughout Pittsburgh area exchanges, and that no new banks of numbers had been opened up in any of the exchanges since publication of the most recent directories. Under these circumstances, added-digit dialing should provide an unbiased probability sample of all listed and unlisted residential telephones.

SELECTING AND OBTAINING WITHIN-HOUSEHOLD RESPONDENTS

The initial contact is a critical point in the telephone survey because the interviewer must both elicit the cooperation of the person telephoned and determine the appropriate member of the household to interview. Once someone answers the telephone, the interviewer must decide who at that number should be interviewed.

If the research design calls for interviewing only heads of households or working women or elderly people or some other particular population, a specialized

[11] Sanford L. Cooper, op. cit.; Gerald J. Glasser and Gale D. Metzger, op.cit.; and J. O. Eastlack and Henry Assael, "Better Telephone surveys Through Centralized Interviewing," *Journal of Advertising Research*, Vol. 6, March 1966, pp. 2-7.

[12] Seymour Sudman, "The Uses of Telephone Directories for Survey Sampling," *Journal of Marketing Research*, Vol. 10, May 1973, pp. 204-207; Matthew Hauck and Michael Cox, "Locating a Sample by Random-Digit Dialing," *Public Opinion Quarterly*, Vol. 38, Summer 1974, pp. 253-260.

screening procedure is required. Other surveys, rather than interviewing whoever answers, must employ some general formula, preferably involving random selection of respondents within households. One of the most difficult and problematical issues in the design of telephone sampling procedures is the trade-off at this point between short systems that minimize refusals, and complex systems that maximize the representativeness of within-household selection.

A common standard for judging within-household selection is that advanced by Leslie Kish. Developed for personal interviewing, his technique requires the respondent to name all members of the household and to list them by sex in order of their ages.[13] The appropriate respondent is then chosen based on a table of random distributions. However, to ask questions immediately about the exact composition of the household increases the probability that the person answering the telephone will refuse the interview and hang up. Hauck and Cox found that obtaining a list of family members, ages, sex, and relationships early in a telephone interview was quite difficult. They concluded that "rapport building, before attempting to obtain family composition seems essential."[14] More detailed selection probing seems to prompt increased refusals. Consequently, the search has been for selection procedures that can offer the most precision with the fewest possible questions.

Troldahl and Carter offered a quicker and simpler reformulation of the Kish method for telephone interviewing which involved only two questions: How many adults in the household? How many are men? For each interview, a table then shows who should be interviewed. They suggest four versions of their selection table,[15] but this number leads to some bias. Their system must oversample one type of respondent in households with three adults. Also, in households with three or more adults of the same sex, only the youngest or oldest are called for, leaving some people with a zero probability of being selected.[16] Together they estimate these two factors lead to a potential 5 percent error in the selection of all eligible adults. As Paisley and Parker point out, the error caused by using only four versions of the selection table can be avoided by using sixty tables. Each questionnaire is assigned one of the 60 tables before the interview, and on balance every adult household member, at least in households of up to five adults, has an equal probability of being chosen.[17]

Bryant has argued that new population trends result in large oversampling of women using the Trohldahl and Carter tables. Coupled with the usually greater nonresponse rates of men, the proportion of male respondents is likely to be sharply reduced.[18] Bryant reports on experiments which manipulated the selection forms

[13] Leslie Kish, "A Procedure for Objective Respondent Selection Within the Household," *American Statistical Association Journal*, Vol. 44, 1949, pp. 380-387.

[14] Matthew Hauck and Michael Cox, op. cit.

[15] Verling C. Troldahl and Roy E. Carter, "Random Selection of Respondents Within Households in Phone Surveys," *Journal of Marketing Research*, Vol. 1, May 1964, pp. 71-76.

[16] Backstrom and Hursh suggested a six-table model that includes the middle-aged people in multiple-adult households omitted in the Troldahl and Carter and random samples in three member households; four and five-adult households are not randomly sampled, however. Charles Backstrom and Gerald Hursh, *Survey Research*, Northwestern Press, 1963, pp. 52-58.

[17] William J. Paisley and Edwin B. Parker, "A Computer Generated Sampling Table for Selecting Respondents Within Households," *Public Opinion Quarterly*, Vol. 29, Fall 1965, pp. 431-436.

[18] Barbara E. Bryant, "Respondent Selection in a Time of Changing Household Composition," *Journal of Marketing Research*, Vol. 12, May 1975, pp. 129-135.

in order to increase the proportion of males interviewed. While some modifications achieved a more satisfactory percentage of male respondents, to the extent they required calling for a disproportionate number of men to offset refusal rates, the tables were no longer random within-household selections but a quasi-quota sample.

One system which attempts to balance the necessity for random respondent selection with a minimum personal opening interrogation is a "designated sex" assignment for each household. This approach was used for the Rand Pennsylvania survey.

The designated-sex method specifies that the sex of the appropriate adult respondent for each household is assigned in advance. Any adult of the designated sex living in the household may then serve as a valid respondent. Thus, interviews either simply ask for an adult of the sex opposite that of the person answering the telephone or else they proceed with the interview of the adult answering the telephone. This designated sex approach is based on the fact that almost three-fourths of all American residences consist of husbands and wives, or single males, or single females, as the only adults in the household. For all such households, the designated sex method produces precisely the same random sample as would more complicated techniques.

The extent to which this method creates a non-random respondent selection among the remainder of the households is a function of the number and sex of the adults in each household. Three-person households, for example, with a husband, wife, and one other adult constituted 15 percent of all households in the Pennsylvania sample. Among such households alternating the designated sex of respondents would result in an ideal selection two-thirds of the time. The spouse of the sex opposite that of the two other adults in the household would be oversampled one-sixth of the time. The member of the sex represented twice in this three-person household who is more likely to stay at home or to answer the telephone would be potentially oversampled one-sixth of the time. Extending these calculations to all household-composition types in the Pennsylvania survey indicated that the designated-sex method directed interviews to the same respondent as would a random table in all but 12 percent of the households. If the simplicity of this selection procedure can avoid driving up the refusal rate, that advantage may be more important than the bias connected with the 12 percent of within-household selections that would have been different under a complex selection system.

The presumption of such an advantage led to the use of the designated-sex approach in the Rand-Pennsylvania survey. However, its actual effectiveness in reducing refusals is uncertain. Little is known about the relative effects of this and other within-household selection systems on telephone refusal rates. Field experiments are needed to systematically contrast the effects of different methods. Dillman, Gallegos, and Frey, for example, examined the impact on refusals of various kinds of opening remarks about the importance and nature of the survey.[19] More such telephone studies are required for opening remarks in general and for within-household respondent selection procedures in particular.

[19] Don A. Dillman, Jean Gorton Gallegos, and James H. Frey, "Reducing Refusal Rates for Telephone Interviews," *Public Opinion Quarterly*, Vol. 40, Spring 1976, pp. 66-76.

REFUSALS

High refusal rates are a problem both in the United States and abroad. [20] "Completion rates" and "refusal rates" are calculated in a variety of ways. Often they are computed as a proportion of all telephone numbers employed in the study so that they become an artifact of such factors as the proportion of business numbers in the exchanges dialed, whether or not people living outside the central city were eligible respondents, and the nature of within-household respondent selection procedures. This report recomputes "refusal rates" as the proportion of all contacted eligible respondents who refuse to be interviewed.

Even using this standardized definition, true refusal rates are often difficult to calculate for telephone surveys. Unassigned telephone numbers sometimes ring as though they were regular working numbers, and so distinguishing invalid numbers from uncontacted households is not always possible. If a screening question is needed to identify a particular type of respondent, calculation of the true refusal rate is difficult since many ineligible individuals will also refuse to be interviewed before one can learn their eligibility status. In the Rand Pennsylvania telephone survey, for example, a high percentage of the numbers in exchanges in the targeted cities included residences outside the city limits. Over half of those who appeared willing to be interviewed lived outside the designated cities. Of those who immediately refused to be interviewed, presumably a comparable proportion also were actually ineligible by virtue of their place of residence. If the refusals may be discounted by the ratio of jurisdictional eligibility to ineligibility found among others, an estimate of the telephone refusal rate may be computed. The estimated proportion of all eligible respondents who refused to be interviewed over the telephone was 28 percent.

This level is comparable to those in many other surveys, using the standardized definition of refusals. For example, Wiseman reported 36 percent refusals over the telephone, and 40 percent in person.[21] Hauck and Cox indicate a telephone refusal rate of 35 percent.[22] In Cleveland, Sudman had refusals of 17 percent in telephone interviews and 23 percent of personal interviews, which compared favorably with the 27 percent in the top ten metropolitan areas and 22 percent in Chicago refusing personal interviews conducted by the National Opinion Research Center.[23] In the first few weeks of their telephone survey, Eastlack and Assael had refusal rates of 30 to 40 percent.[24] As the survey progressed and poor interviewers were removed the refusal rate went down to 20 percent or less.

Refusal rates for telephone surveys thus vary around a third to a fourth of the

[20] Report of a Working Party on the Market Research Society's Research and Development Committee, "Response Rates in Sample Surveys," *Journal of Market Research Society*, Vol. 18, No. 3, 1976, pp. 113-142. Despite the general impression that refusal rates have grown worse, Kent Marquis shows that there has been no substantial increase in refusals in the United States. "Survey Response Rates: Some Trends, Causes and Correlates," The Rand Corporation, P-5863, April 1977. See also, Don A. Dillman, *Mail and Telephone Data Collection Methods*, Wiley-Interscience, New York, forthcoming.

[21] Frederick Wiseman, "Methodological Bias in Public Opinion Surveys," *Public Opinion Quarterly*, Vol. 36, Spring 1972, pp. 105-108.

[22] Matthew Hauck and Michael Cox, op. cit.

[23] Seymour Sudman, op. cit.

[24] J. O. Eastlack and Henry Assael, op. cit.

eligible respondents contacted, but there are exceptions.[25] A few studies, some involving telephone reinterviewing, report reducing refusal to less than 15 percent. These include Weller,[26] Cooper,[27] Hochstim,[28] and Schmiedeskamp.[29] At the other extreme, they can be very high. Falthzik discusses a survey of women in some of the Maryland surburbs of Washington D.C., in which refusals reached 52 percent.[30]

The consequences of high refusal rates depend on the extent to which refusals are associated with relevant respondent characteristics. Using telephone survey data, the effects of refusals and the other telephone sampling issues can be examined using five telephone samples collected in western Pennsylvania.

SAMPLING PRECISION IN FIVE CITY TELEPHONE SURVEYS

The impact of telephone survey methods on the representativeness of the final sample is the joint effect of four factors which have just been discussed: (1) the extent to which telephone households reflect the entire population; (2) the extent to which an unbiased sample of all listed and unlisted telephone households may be achieved; (3) effects of within-household respondent selection techniques; and (4) noncompletion rates, including whether the selected respondent can be found at home and refusal rates. Data and findings reviewed here imply that little bias should emerge at least from the first two factors. Potential bias from within-household selection and differential refusal rates, along with the cumulative impact of all four factors, are of the greatest concern.

The data to be used to report on the validity of telephone samples are drawn from a survey of seven cities in Pennsylvania conducted in September and October 1976. Appendix A describes in detail the procedures employed in the survey, but briefly the survey was conducted in a way and under conditions similar to many telephone studies.

The penetration of telephones in the seven cities was close to that of the nation as a whole, and exceeded 90 percent in most cities. Added-digit dialing was employed to draw the sample. Telephone numbers were drawn from published telephone directories and a constant was added to the last digit.

Up to five telephone calls to a number were required in order to reach the eligible respondent, and respondents were selected by means of the alternating designated-sex approach described earlier. When the person who answered the telephone was the predesignated sex, the interviewer proceeded immediately. If not, the interviewer asked to speak to a person of the opposite sex. The calls were

[25] Advance letters soliciting cooperation and explaining the importance of the survey have been shown to substantially reduce refusal rates. Although they cannot be used with random-digit or added-digit dialing, advance letters may be sent when the addresses of respondents are known in advance. See Don A. Dillman, Jean Gorton Gallegos, and James H. Frey, op. cit.

[26] Tom Weller, "Telephone Interviewing Procedures," *Survey Research*, Vol 5, No. 1, January 1973, pp. 13-14.

[27] Sanford L. Cooper, op. cit.

[28] Joseph R. Hochstim, "A Critical Comparison of Three Strategies of Collecting Data From Households," *American Statistical Association Journal*, Vol. 62, September 1967, pp. 976-989.

[29] Jay W. Schmiedeskamp, op. cit.

[30] Alfred M. Falthzik, "When to Make Telephone Interviews," *Journal of Marketing Research*, Vol.9, November 1972, pp. 451-452.

conducted by interviewers calling long distance from the central WATS facility of the Opinion Research Corporation in Princeton, New Jersey. Rand and ORC jointly supervised the work more closely than is probably common in market research. If one includes as refusals all respondents who began but prematurely terminated the interview, the final telephone refusal rate among eligible respondents was approximately 28 percent. Disentangling the extent to which various factors biased the final sample is infeasible with this survey. Of interest is the net impact of all sampling and selection procedures on the resulting sample.

Measurement of sample bias is complicated by response bias and by outdated census comparisons. Some variables are more likely than others to include response bias, so error could result as much from inaccurate responses to questions as from sampling bias. Questions about respondent income are particularly difficult to ask, and will be treated in detail in Section III under response reliability. Also, the census data were six years out of date at the time of the survey.[31] Thus, standards of comparison are somewhat unstable.

The results of the five city surveys where samples of 400 and 500 respondents were collected nonetheless show a substantial congruity between the telephone surveys and available data on the city populations.[32] Table 4 compares results of the telephone sampling procedures and 1970 population characteristics of the five cities. The telephone sample was within two standard errors of the Census percentages of blacks and other non-white races in each city but Johnstown. Since good estimates of proportions on the order of 10 percent are usually difficult with small samples, the accuracy of the estimates of government workers is also important to note. The average absolute error in these estimates was less than 2 percent. In two cities, statistics were available on the city wide subscription to cable television services. In McKeesport, 44.3 percent of city households were on the cable compared to 48.0 percent of the telephone sample. The 88.3 percent of Williamsport households with cable television was close to the 90.8 percent in the Rand survey who said they had cable television. Again, both sample estimates are within two standard errors of the city proportions.

Turning to measures more likely to induce overreporting, Table 5 shows the proportions of adults who recalled they had voted in past elections and said they were registered for the 1976 elections. Previous research reveals that voting recall is consistently 5 to 10 percent or more higher than official figures.[33] Anything substantially greater would indicate the telephone survey oversampled the part of the population that actively vote, while no differences or lower recalled levels of voting would mean that the less active had been oversampled. In all five cities on all three voting-related measures, however, the telephone sample shows a consistently modest overreporting in the range of what prior research would predict for a representative sample. Only two instances lie outside a 4 to 9 percent overreport-

[31] Tables 4 and 6 report 1970 Census figures without any extrapolations, along with cable television figures provided by local CATV managements. City registration and voting figures for Tables 5 and 7 came from the offices of the county clerks, and the number of adults by city in 1976 used to calculate proportions are based on linear extrapolations from 1970 and 1973 Census data.

[32] Given the traditional concern with telephone undersampling of low-income families, the reader may wish to refer to Table 10 to see that there was also no apparent high-income bias in the final telephone sample.

[33] Aage R. Clausen, "Response Validity: Vote Report," *Public Opinion Quarterly*, Vol. 32, Winter 1968-69, pp. 588-600; and Blair T. Weir, "The Distortion of Voter Recall," *American Journal of Political Science*, Vol. 19, February 1975, pp. 53-63.

Table 4

COMPARISON OF TELEPHONE SURVEY ESTIMATES WITH POPULATION CHARACTERISTICS
(percent)

Population Characteristics	1970 Census	Rand Survey Estimate	Rand Survey Standard Error	Difference
Blacks				
Greensburg	1.4	1.5	± 0.6	+ 0.1
Johnstown	6.5	4.0	± 0.9	- 2.5
McKeesport	10.5	8.2	± 1.2	- 2.3
Pittsburgh	20.7	16.9	± 1.9	- 3.8
Williamsport	3.2	2.8	± 0.8	- 0.4

	1970 Census	Rand Survey Estimate	Rand Survey Standard Error	Difference
Government employees[a]				
Greensburg	11.8	11.3	± 1.8	- 0.5
Johnstown	11.8	11.2	± 1.6	- 0.6
McKeesport	12.0	9.2	± 1.5	- 2.8
Pittsburgh	14.9	16.0	± 2.1	+ 1.1
Williamsport	9.3	12.8	± 1.9	+ 3.5

	1976 Cable Data	Rand Survey Estimate	Rand Survey Standard Error	Difference
Subscribing cable households[b]				
McKeesport	44.3	48.0	± 2.2	+ 3.7
Williamsport	88.3	90.8	± 1.4	+ 2.5

[a]Government employees as percent of employed heads of households.

[b]Service estimates provided by local cable operators. The number of subscriber households was divided by total city household. Data not available for Greensburg, Johnstown, and Pittsburgh.

ing of having voted in the 1975 local elections, and the disparity may be attributable to special elections that year in addition to the regular November municipal elections, rather than to the telephone sampling technique.

Thus, the overall sample characteristics for each city were acceptable representations of the adult populations. Reasonable estimates of population characteristics were obtained by drawing samples of 400 and 500 respondents from telephone households; using added-digit dialing, four telephone callbacks, designated sex with quotas, and holding the refusal rate to 28 percent. Having reported that result in five city samples, we can turn to the other cities in the western Pennsylvania study to compare telephone and personal surveys. But first, sampling procedures usually associated with face-to-face interviews in households should be reviewed.

Table 5

COMPARISON OF TELEPHONE SURVEY ESTIMATES WITH ELECTION RECORDS
(percent)

Voting Activity	Election Records[a]	Rand Survey		
		Estimate	Standard Error	Difference
Voted in 1972 National Election				
Greensburg	55.6	61.6	± 2.4	+ 6.0
Johnstown	57.4	61.5	± 2.1	+ 4.1
McKeesport	58.9	62.7	± 2.2	+ 3.8
Pittsburgh	58.1	66.6	± 2.4	+ 8.5
Williamsport	52.0	60.2	± 2.4	+ 8.2
Voted in 1975 Local Election				
Greensburg	37.9	44.3	± 2.5	+ 6.4
Johnstown	47.7	50.8	± 2.2	+ 3.1
McKeesport	45.7	54.8	± 2.2	+ 9.1
Pittsburgh	37.0	51.4	± 2.3	+ 14.4
Williamsport	37.0	50.5	± 2.5	+ 13.5
Registered in 1976[b]				
Greensburg	61.6	66.2	± 2.3	+ 4.6
Johnstown	66.2	68.3	± 2.1	+ 2.1
McKeesport	71.0	74.7	± 1.9	+ 3.7
Pittsburgh	72.2	75.3	± 2.2	+ 3.1
Williamsport	59.9	67.7	± 2.3	+ 7.8

[a]Turnouts and registration were divided by Census projections of the total number of adults in each city that year to obtain the percentages of adults who voted and were registered

[b]Data only available for November, after registration was closed. Survey estimates are for September-October.

PERSONAL INTERVIEWS AND CLUSTER SAMPLING

Personal interviewing where interviewers question respondents face-to-face at the respondent's home is the dominant survey research method in the social sciences. Personal interview sampling procedures require a series of practical compromises that diverge from the ideal of a random sample. In contrast to the telephone sample, the typical personal survey uses a cluster sample approach which keeps down costs. But the area clustering of interviewing has an inherent statistical weakness that often increases sampling error.

National, state, and large metropolitan surveys rely on multistage area probability sampling procedures that select types of geographic units weighted according to their population. Thus a national or regional survey will assign a fraction of the total interviews being planned to represent proportionately the very largest cities, large metropolitan areas, small metropolitan areas, and counties without cities. These interviews will then be collected in "clusters" of perhaps a dozen interviews each. Thus, for examples, in a total sample size of 1,500 interviews, if 300 must be collected in counties without small cities and the cluster size is to be 12, then 25

clusters must be identified in such countries. Twenty-five census districts would thus be randomly selected in rural areas (under regional quotas).[34]

Personal interviews are collected in "clusters" within small geographic areas in these census districts. Typically for each census district, a single household address is selected, and interviewing begins with a respondent in an adjacent household.[35] Starting from that adjacent household, the remainder of the cluster is chosen following predesignated rules. Over years of experience, detailed rules have been developed to handle apartment houses, vacant buildings, dead-end streets, and new construction. Cluster listing of households can be done by supervisory personnel before the interviewing begins but in many cases it is trusted to the interviewer. In either event, it is essential that the selection is not influenced by the interviewer's preferences as to what households he or she would like to interview. The requisite number of interviews is then completed in each geographic cluster.

Personal surveys employ the clustering approach in order to keep the cost of interview time within bounds. Concentration of interviewing within a series of clearly defined areas reduces time and travel costs both for the initial contact and for callbacks. This means that most alternatives to cluster sampling would prohibitively inflate the costs of personal interviews. Telephone sampling, it should be remembered, is under no such constraints.

As Sudman discusses in his useful review of cluster sampling, homogeneous clusters can substantially increase the sampling error of a survey.[36] Using cluster sampling, the power of the sample to estimate the population is reduced in proportion to the number and size of clusters and the degree of within-cluster homogeneity. For example, if voting preferences were not geographically concentrated and were as heterogeneous as the total population, then large clusters would not pose a serious difficulty. But if clusters are homogeneous in terms of socioeconomic status, race or ethnicity, and these factors relate to the phenomenon under investigation, the cluster approach substantially decreases the sample's power to accurately estimate the characteristics of the universe being studied.

COMPARATIVE SURVEY METHODOLOGIES: THE BETHEL PARK AND WILKINSBURG SAMPLES

In comparing telephone and personal surveys, it is important to remember that both methodologies have certain limitations and advantages. In terms of sampling, this discussion has suggested that the actual universe sampled is almost identical for the two methods, and that the impact of refusal rates is likely to be comparable. Personal interviews, however, more easily permit a detailed within-household respondent selection procedure. On the other hand, personal interviews are almost always tied to some form of cluster sampling given the high costs involved in interviewing households scattered over a wide area. In contrast, telephone sampling of households does not depend on neighborhood clusters and can be random.

[34] For a discussion of a national probability sample, see Leslie Kish, *Survey Sampling*, John Wiley and Sons, New York, 1967, pp.148-173.

[35] By starting with the adjacent household, this approach minimizes bias that could come from the absence of new construction on residential listings.

[36] Seymour Sudman, *Applied Sampling*, Academic Press, New York, 1976, pp. 69-84.

The question then is what is the net effect of these limitations and advantages on the final sample obtained by each approach. The Rand Pennsylvania survey permits us to address this issue because its design included the collection of comparative data in two different cities. Half of the 400 interviews in Bethel Park and half of the 400 Wilkinsburg interviews were collected by telephone using the same procedures employed in the other five city telephone surveys. The remaining 200 interviews in each of these two cities were collected by personal interviews. Those two cities were selected because, based on their different demographic characteristics, they appeared to represent two different contexts for survey research. Bethel Park is a growing, affluent community, with many middle- and upper-class citizens. Wilkinsburg is a predominatly blue-collar city, with a varied socioeconomic mix. It has a growing black population, and some declining neighborhoods that are associated with a variety of interviewing problems both for telephone and for personal interviews. These two cities represent the two circumstances under which the two data collection techniques would most be expected to produce divergent findings for reasons of sampling and response rates.

In both cities, personal interviewing was conducted concurrent with the telephone survey and employed exactly the same within-household respondent selection procedures and the same questionnaire. The only difference was that one survey was conducted face-to-face and used cluster sampling, while the other was over the telephone and used added-digit dialing. In each city, the personal interviews were collected in 25 clusters with 8 completed interviews in each cluster. A starting point was designated for each of the clusters, and every second address was listed as a selected address. Addresses where there were refusals, ineligible respondents, or where no one was at home after five visits were replaced by extending the listings in that cluster. Refusals constituted 18 percent of the eligible respondents in Bethel Park and 24 percent in Wilkinsburg.

When the results are compared, the most evident conclusion is that the two methods produced similar samples, with the telephone samples being slightly more representative of the population. In estimating the number of employed heads of household that are government employees, the telephone survey was within one standard error of the Census figure. Table 6 shows that the personal interview data underestimated that figure.[37] The telephone samples were good estimates of the number of homes subscribing to cable television, again within the standard error. And again, the personal interviews were less accurate. The discussion of income findings in Section III will also show that the distribution of family incomes obtained in the Bethel Park and in the Wilkinsburg telephone samples more closely reflected projections derived from the Census data than did the personal interview figures (Table 10).

Perhaps the most interesting difference between the telephone and personal samples involved the race and home ownership of respondents. The results in both surveys were similar in Bethel Park where, according to the Census Bureau, less than one percent of the 35,000 residents were black. By contrast, the results of both

[37] An adjustment is made in computing the standard error for the personal interview samples as in Tables 6 and 7. The true sampling error of cluster samples depends on the size of the clusters and the amount of homogeneity within clusters, since clustering reduces the number of independent observations. See Sudman, op. cit., p. 76. Comparison of the standard errors in Tables 6 and 7, where the telephone sampling error is computed assuming a random sample, show the statistical power lost by using a cluster structure.

Table 6

COMPARISON OF TELEPHONE AND PERSONAL SURVEY ESTIMATES WITH POPULATION CHARACTERISTICS
(percent)

Population Characteristics	Census	Rand Survey Estimate	Rand Survey Standard Error[c]	Difference
Blacks				
Bethel Park				
Telephone Survey	0.7	0.5	± 0.5	- 0.2
Personal Survey		0.0	± 0.0	- 0.7
Wilkinsburg				
Telephone Survey	20.4	34.4	± 3.4	+ 14.0
Personal Survey		23.2	± 5.7	+ 2.8

	1970 Census	Rand Survey Estimate	Rand Survey Standard Error[c]	Difference
Government employees[a]				
Bethel Park				
Telephone Survey	11.6	10.6	± 2.2	- 1.0
Personal Survey		5.0	± 3.8	- 6.6
Wilkinsburg				
Telephone Survey	13.4	15.9	± 2.9	+ 2.5
Personal Survey		9.9	± 4.8	- 3.5

	1970 Cable Data	Rand Survey Estimate	Rand Survey Standard Error[c]	Difference
Subscribing cable households[b]				
Bethel Park				
Telephone Survey	49.3	52.1	± 3.4	+ 2.8
Personal Survey		41.0	± 5.5	- 8.3
Wilkinsburg				
Telephone Survey	40.9	43.4	± 3.5	+ 2.7
Personal Survey		35.0	± 5.6	- 5.9

[a]Government employees as percent of employed heads of households.

[b]Service estimates provided by local cable operators. The number of subscriber households was divided by total city households. Data not available for Greensburg, Johnstown, and Pittsburgh.

[c]The standard error for the telephone survey is a straightforward calculation based on the sample size and the assumption of a random sample. The personal survey error follows Sudman in adjusting the standard error to reflect the greater inaccuracy due to cluster variance.

surveys sharply differed with the 1970 Census report of the racial composition of Wilkinsburg. This difference in the Wilkinsburg survey is also correlated with differing telephone and personal survey findings on home rentals and home ownership.[38] The telephone survey in Wilkinsburg found more renters than did the in-person survey, a difference consistent with the fact that more blacks in Wilkinsburg were renters.

The consistent pattern of these differences suggests a systematic bias in one of the two methods. The variable of race can be contrasted with Census data. At first glance, looking at the 1970 Census figures on race in Table 6, the personal interviews seem more accurate. Additional information indicated instead that the telephone sample is a superior estimate of the number of blacks in Wilkinsburg. The black population has grown rapidly. In 1970, according to the Census Bureau, Wilkinsburg was 20.4 percent black—a 637 percent increase over 1960. Local observers confirm that the black proportion of the population has continued to grow, but there are no official estimates available. In 1970, about 30 percent of all Wilkinsburg public school children were black. In 1976, the superintendent of schools estimated that 54 percent were black. Based on these data, it seems certain that Wilkinsburg was substantially more than 20 percent black in 1976, and was probably over 30 percent black. This evidence suggests that the telephone sample's 34 percent black proportion is a more accurate reflection of the Wilkinsburg population than the personal interview sample's 23 percent black. Not only does the telephone figure appear to be more accurate, but the telephone sample includes more blacks than the personal interviews. This is the reverse of what would be expected from the historic concern that telephone sampling underrepresents disadvantaged populations.

The explanation for fewer blacks in the personal survey is probably attributable to where the 25 clusters happened to fall in the city, and their homogeneity. Of 25 clusters in Wilkinsburg, 11 contained no black respondents, while four were three-fourths or more black. This homogeneity of neighborhoods means that because one happened by chance to draw starting points in just one or two extra white rather than black neighborhoods, the estimate is biased. This risk is present in any cluster sample in which the number of clusters is not very large, and is particularly severe when neighborhoods are homogeneous. As predicted by sampling theory, a random telephone sample of households drew a better estimate of the universe being surveyed than clustered personal interviews with the same number of respondents. When neighborhoods are homogeneous as they are in Wilkinsburg, the bias is all the greater.[39]

Comparing the results of the two surveys on all other respondent characteristics shows that the two methods arrived at the same estimates. Since recent Census data are not available in comparable form, there is no way to judge the relative accuracy of the two methods on these variables. Still, it is worth noting that there were no statistically significant differences between the personal and tele-

[38] The home ownership question on the surveys had a different form from that used by the Census, precluding that comparison. Using the survey data, 29.6 percent of the telephone sample compared to 40.4 percent of the in-person survey reported owning their own homes.

[39] Another supplemental explanation is that personal interviewers had some difficulty in gaining access to apartment buildings. When interviewers did gain admittance, they also encountered higher refusal rates. Thus there may be a differential interview completion rate in personal interviews that underrepresented blacks, and hence renters, in Wilkinsburg.

phone samples in each city on responses to questions of age, education, or marital status.[40]

Turning to variables on past political participation, where official statistics are available, we find a more mixed pattern (Table 7). Bethel Park finds identical estimates for both methods for the 1972 vote, a somewhat high estimate of 1975 voting in the telephone data, and consistent underreporting in voter registration. In this affluent city, many voters may have registered in late October after this survey was conducted. The estimates provided by the two methods in Wilkinsburg were different, and difficult to interpret in light of the differences between the samples regarding blacks and renters. The 1972 voting estimates are in the same range, but the telephone survey seems to underreport the 1975 turnout while the personal survey underestimates the voter registration.

This review of the literature and the findings from the Rand Pennsylvania surveys indicate that the telephone has become an accurate medium for securing a representative sample of most populations.[41] After including the joint effects of the sampling universe, simple within-household respondent selection, and refusals, the final telephone samples closely matched the communities surveyed and were at least as accurate as the personal interview sample. If there are major limits on the use of telephone surveys, they must be found in the nature and reliability of the questions that can be asked by telephone.

[40] The age and education level of the growing black population in Wilkinsburg are relatively close to that of the white population, so the racial differences found by the two survey methods does not significantly affect other demographic characteristics.

[41] To keep in perspective the findings in this section, a caveat should be offered. In one respect the Bethel Park and Wilkinsburg comparisons failed to exploit the presumed personal interview advantage for allowing detailed within-household respondent selection procedures. In this study, both the telephone and personal questionnares employed the simple designated-sex approach.

Table 7

COMPARISON OF TELEPHONE AND PERSONAL SURVEY ESTIMATES WITH ELECTION RECORDS
(percent)

Voting Activity	Election Records[a]	Rand Survey		
		Estimate	Standard Error	Difference
Voting in 1972 National Election:				
Bethel Park				
Telephone Survey	72.2	74.0	± 3.0	+ 1.8
Personal Survey		74.0	± 4.9	+ 1.8
Wilkinsburg				
Telephone Survey	58.0	65.3	± 3.4	+ 7.3
Personal Survey		61.0	± 5.8	+ 3.0
Voting in 1975 Local Elections:				
Bethel Park				
Telephone Survey	44.1	53.5	± 3.4	+ 9.6
Personal Survey		46.5	± 5.4	+ 2.4
Wilkinsburg				
Telephone Survey	33.4	33.2	± 3.3	- 0.2
Personal Survey		44.5	± 5.6	+ 11.1
1976 Voter Registration:[b]				
Bethel Park				
Telephone Survey	82.7	77.7	± 2.9	- 5.0
Personal Survey		76.7	± 4.4	- 6.0
Wilkinsburg				
Telephone Survey	70.9	74.4	± 3.1	+ 3.5
Personal Survey		67.5	± 5.6	- 3.4

[a]Turnouts and registration were divided by Census projections of the total number of adults in each city that year to obtain the percentages of adults who voted and were registered.

[b]Data only available for November, after registration was closed. Survey estimates are for late September.

3. TELEPHONE SURVEY RESPONSE RELIABILITY

The interaction among sensitive or complex questions, interviewer and respondent rapport, the interview mode, and the respondent's personality all affect the relative reliability of telephone and personal interview responses. Responses over the telephone, it has been argued, are not as intrinsically reliable as those given in face-to-face interviews. Others maintain that personal interaction increases the tendency to give socially desirable answers. This section will first review the literature on telephone response reliability and then will examine the comparability of telephone and personal responses in the Bethel Park and Wilkinsburg surveys.

EARLY RESEARCH ON RELIABILITY

Some 55,000 leaflets were dropped over parts of Salt Lake City in 1951 for a message diffusion study. After subsequent interrogation of respondents in the test areas, Larsen concluded that face-to-face interviews minimized prestige-motivated exaggeration compared to telephone interviews. However, several problems appear in the study design, including the failure to randomly assign interviews. All respondents in one neighborhood were interviewed in person, while all of those in the second area were telephoned. Later research rarely supported Larsen's findings.[1]

Another of the earliest telephone and personal interview comparisons reported in a scholarly journal is Oakes' brief account in 1954 of differences in frequency of responses to an open-ended question. Two hundred sixteen students were canvassed for suggestions for improving the university cafeteria. Personal interviews produced twice as many suggestions per respondent (2.80) as telephone interviews (1.39). Oakes believed that the inherent nature of personal interviews encouraged people to "express their attitudes and opinions more fully." Oakes also noted that a search of journals over the preceeding 12 years failed to uncover a single article contrasting the relative merits of the two survey approaches, and that a "body of reliable evidence" was needed.[2]

Not until the 1960s, however, did social science and marketing journals begin to publish findings of interview-method comparison studies. Cahalan surveyed new car owners in the New York City area regarding newspaper reading habits of the New York *Herald Tribune*. The proportion recalling having read particular newspapers "yesterday" in telephone interviews was very close to that in personal interviews. Follow-up visits after the initial telephone interview provided copies of recent newspapers for "aided recognition," but approximately 98 percent of the respondents maintained their earlier judgments.[3]

[1] Otto N. Larsen, "The Comparative Validity of Telephone and Face-to-Face Interviews in the Measurement of Message Diffusion from Leaflets," *American Sociological Review*, Vol. 17, August 1952, pp. 471-476.

[2] Ralph H. Oakes, "Differences in Responsiveness in Telephone Versus Personal Interviews," *Journal of Marketing* Vol. 19, October 1954, p. 169.

[3] Don Cahalan, "Measuring Newspaper Readership by Telephone: Two Comparisons with Face-to-Face Interviews," *Journal of Advertising Research*, Vol. 1, December 1960, pp. 1-6.

In 1962, Schmiedeskamp's analysis of two University of Michigan Survey Research Center economic polls provided the first major published consideration of telephone and personal interviewing using a large cross-sectional data base. Telephone respondents, however, constituted the second wave of a panel which was initially interviewed face-to-face. Schmiedeskamp makes clear the findings apply only to telephone reinterviews and not necessarily to "cold" telephone surveys where the respondent had not been previously contacted. Economic and consumer data derived from the two approaches were "very nearly equivalent" on almost all items with only a few exceptions. Any patterns in the differences were difficult to discern. Telephone reinterview responses were not consistently more optimistic or more guarded than answers in person. Contrary to Oakes' early finding, telephone responses were not notably less verbal to open-ended and "why" questions. They were, on the other hand, slightly more inclined to opt for neutral anwers ("same", "depends", "uncertain", "as expected") over the telephone. Accompanied by the appropriate caveats, Schmiedeskamp's article suggested cautious optimism regarding the relative reliability of telephone surveys and hinted that any systematic differences in telephone results, given sampling comparability, are likely to be fairly subtle.[4]

In the 1960s many commercial researchers expanded their use of telephone surveys and began to use central telephoning facilities and WATS lines for less expensive long distance interviewing. If methodological studies were conducted as part of this research, it was seldom published, and the data were proprietary. One exception was a brief note in which Assael indicated that telephone responses on product purchases were highly correlated with store audits of actual product sales.[5]

An absence of method bias was suggested by Wheatley who conducted an imaginative study among 222 University of Washington students. Eleven bipolar scales were constructed to measure attitudes towards various brands of beer. Each scale (smooth/rough; prestigious/ordinary, etc.) contained nine intervals. Respondents were asked to "look at the numbers on your telephone dial; so that number 1 would present one extreme of the scale and number 9 the other." Mean evaluation scores over the telephone did not differ statistically from those made on self-administered written questionnaires.[6] Most social scientists, however, doubted the relevance of the market research methods. Using telephones might be "cost effective" for obtaining reasonable product information about shampoo and peanut butter, but social scientists wanted precise data on more sensitive topics. Studies on beer were not persuasive.

RELIABILITY OF SENSITIVE QUESTIONS

There is a small but growing social science literature which suggests that telephone surveys do obtain the same results as personal surveys. Reliability has now been demonstrated in highly personal areas of crime, health, and income. In

[4] Jay W. Schmiedeskamp, op. cit.

[5] Henry Assael, "Comparison of Brand Share Data by Three Reporting Systems," *Journal of Marketing Research*, Vol. 4, November 1977, pp. 400-401.

[6] John J. Wheatley, "Self-Administered Written Questionnaires or Telephone Interviews?" *Journal of Marketing Research*, Vol. 10, February 1973, pp. 94-96.

the area of crime, Tuchfarber and Klecka compared the findings of random-digit dialing telephone polling with personal interviews for crime victimization research. Victimization data from the two techniques were significantly different. Respondents revealed that they had been subjected to criminal activities more often through telephone contacts that they did in person. On the assumption that the approach which uncovers more crime is the better method, Tuchfarber and Klecka judged the telephone survey results superior.[7]

Research in the health field includes impressive evidence that surveys conducted by telephone do as well as personal interviews in obtaining highly personal information. Josephson reported highly successful results in telephone screening individuals for visual impairment in Cleveland. Telephone contacts with over 2,000 people provided findings equivalent with 183 personal interviews, and were confirmed by subsequent personal interviews which found little or no over or under-reporting of visual problems by telephone.[8] Hochstim contrasted the results obtained from two California County Health surveys. One poll obtained 977 mail questionnaires, 518 telephone, and 284 personal interviews. A second survey of women over age 20 completed 524 mail questionnaires, 285 telephone, and 137 personal interviews. By and large responses were consistent across all three methods. Although the health surveys included sensitive subjects, relating to cervical cancer and pelvic examinations, Hochstim found data which was "virtually interchangeable" among approaches on most substantive questions.[9]

Although they did not conduct face-to-face interviews, other research groups found that very personal information could be collected by telephone. Mooney, Pollack and Corsa report that the California Department of Public Health questioned women in Contra Costa County over the telephone regarding menstrual cycles, pregnancy, and illnesses and obtained very high degrees of cooperation.[10] Coombs and Freedman recount the successful telephone reinterviews with Detroit area women for a longitudinal fertility study.[11]

These findings are further supported by two general studies that include data on both telephone and personal surveys across a range of substantive questions. Results of telephone interviews with 85 people who had earlier been interviewed personally were contrasted to data from 98 personal reinterviews. The respondents were New York City residents living in two community planning districts. Rogers concluded:

> The results indicate that the quality of data obtained by telephone is comparable to that obtained by interviews in person. Respondents can and do answer complex items on the telephone; they reveal sources and amounts of income; they report years of schooling and whether they voted in recent elections.[12]

[7] Tuchfarber and Klecka, op. cit., pp. 47-63.

[8] Eric Josephson, "Screening for Visual Impairment," *Public Health Reports*, Vol. 80, No. 1, January 1965, pp. 47-54.

[9] Joseph R. Hochstim, op. cit.

[10] H. William Mooney, Beatrice Pollack and Leslie Corsa, Jr., "Use of Telephone Interviewing to Study Human Reproduction," *Public Health Reports*, Vol. 83, No. 12, December 1968, pp. 1049-1060.

[11] Lolagene Coombs and Ronald Freedman, "Use of Telephone Interviews in a Longitudinal Fertility Study," *Public Opinion Quarterly*, Vol. 28 Spring 1976, pp. 112-117.

[12] Theresa R. Rogers, "Interviews by Telephone and in Person: Quality of Responses and Field Performance," *Public Opinion Quarterly*, Vol. 40, Spring 1976, pp.51-65.

Similarly, Locander, Sudman, and Bradburn found that responses to increasingly threatening questions were equally distorted in telephone as they were in face-to-face interviews. The proportion of those incorrectly claiming no conviction of drunken driving, having voted in the primary election, not having declared bankruptcy, holding a library card, and being registered to vote was the same in both types of interviews. Checked against available records, distorted responses were progressively greater for the threatening questions, especially drunken driving, but the degrees of inaccuracy for both interview methods were parallel on each item.[13] Telephone surveys did not avoid the problems created by threatening questions, but there was no reason to prefer personal interviews over telephone interviews.

Personal finances may, however, be more taboo over the telephone (and in person) than health and most other questions. Distinguishing between questions that might threaten respondents with some social embarassment and those that relate to their economic well-being may be necessary, since personal and family income questions provoke far more refusals to answer than do other questions. Schmiedeskamp's telephone reinterview of an SRC national sample prompted the following observation:

> Telephone respondents appeared reluctant to divulge personal financial data. In November 1959, only 36 percent of telephone respondents admitted to having installment debt, compared with 43 percent of personal-contact responents Telephone respondents were also less frequently willing to estimate their family incomes for the current or following year. Furthermore, over the telephone many respondents would only supply brackets which in many cases had to be suggested by the interviewers.[14]

This point is important and explains why most telephone survey research on income data has moved to the use of ranges of income. When the question is put in bracket form, the telephone interview provides relatively comparable data (Table 8). Despite the reluctance of telephone respondents to specify precise financial figures, they were only slightly less likely to select one of several income brackets than were personally interviewed respondents. For surveys where ranges alone are adequate, this limitation does not present a drawback.

Other research asking the respondents to report the range into which their income falls have confirmed the fact that income data can be collected by telephone. Brunner and Brunner, although not citing how the telephone question was phrased, used five categories of income and obtained a 79 percent completion rate from households with unlisted telephones and 85 percent from those which were listed.[15] Rogers achieved somewhat higher completion rates among New York City residents and obtained answers to family income questions in 88 percent of the personal interviews and in 80 percent in telephone interviews. Although the difference was not statistically significant, the telephone again did less well. Rogers' panel also revealed that there was not actually a hard-core of people who persistently refused to discuss income. Only 4 percent of the sample refused both in 1972 and in 1974

[13] William Locander, Seymour Sudman and Norman Bradburn, "An Investigation of Interview Method, Threat and Response Distortion," *Journal of the American Statistical Association*, Vol. 71, No. 354, June 1976, pp. 269-275.

[14] Schmiedeskamp, op. ct., p. 34.

[15] James A. Brunner and Allen G. Brunner, op. cit.

Table 8

WILLINGNESS TO PROVIDE INCOME DATA BY QUESTION TYPE

Financial Responses	June 1959		November 1959	
	Telephone Reinterviews	Personal Interviews	Telephone Reinterviews	Personal Interviews
Supplied an estimate of income expected during the current or following year	74%	80%	73%	78%
Named a dollar amount	50	73	50	61
Supplied only an income bracket	24	7	23	17
Number of cases	(340)	(957)	(365)	(963)

SOURCE: Schmiedeskamp (1962), p. 31.

to report their income. Seventeen percent refused on one occasion but did respond to the other.[16] Locander and Burton tested four different techniques for asking total income over the telephone. Their chief concern was the effect question wording and various presentations of seven income categories would have on under- or over-reporting of income. In terms of reducing refusals, however, it turned out that none of their approaches was especially effective. Completion rates ranged from 71.1 percent to 75.9 percent.[17]

In a 1976 University of Michigan Survey Research Center national telephone poll, 37 percent of the respondents did not supply answers to an open-ended annual family income question compared to 13 percent in a parallel personal interview survey.[18] When income was asked in terms of three broad categories, however, only 17 percent of the SRC telephone sample did not answer. The Michigan study had similar refusal rates for items concerning spouse's income, and slightly fewer refusals for open-ended and three-category questions on the respondents' incomes and size of their tax refunds.

These SRC surveys also asked people if they felt uneasy about discussing particular topics on the telephone or in person. Unease regarding income questions over the telephone surpassed all other topics with 28 percent of the respondents saying they were uncomfortable discussng this subject. In person, 15 percent said they were uneasy talking about income with the interviewer, although respondents may have been more reluctant to admit their discomfort in a face-to-face situation. By way of contrast, 9 percent were uneasy discussing their voting behavior over the telephone compared to 8 percent in person.[19]

[16] Rogers, op. cit.

[17] Wiliam B. Locander and John P. Burton, "The Effect of Question Form on Gathering Income Data by Telephone," *Journal of Marketing Research*, Vol. 13, May 1976, pp. 189-192.

[18] Robert M. Groves, "A Comparison of National Telephone and Personal Interview Surveys: Some Response and Nonresponse Differences," paper presented at the 1977 meeting of the American Association of Public Opinion Research, p. 21.

[19] Ibid., p. 19.

The studies reviewed here support the view that the best approach to ascertaining income is through questions that ask the respondents to choose among several income ranges. At the same time, they point up the likelihood that asking detailed financial questions risks high refusal rates and biased responses in personal and particularly in telephone surveys.

A Comparison of Income Responses by Survey Method

Using four categories of income ranges, the Rand Pennsylvania survey provides further evidence that a simple income question can provide reliable data. In that survey, the income question achieved an 89 percent completion rate, which was higher than the rates reported in earlier studies.[20] Moreover, the telephone completion rate was as high as the personal interview rate on this question (Table 9). A review of the three factors that account for these low refusal rates helps us understand what influences refusals to answer income questions.

First the income brackets were broad, simple, and few. The four categories were "under $10,000," "between $10,000 and $15,000," "between $15,000 and $20,000," and "over $20,000." Often social science research has little need for more refined categories, especially not at the sacrifice of higher refusal rates. Since the substantive purpose of this question for the Rand research was to aid in assigning respondents to general categories (high, medium, and low) of socioeconomic status, a high completion rate was more essential to the research than precise income figures.

Second, the question wording successfully grafted into the telephone interview part of a technique which has proven effective in personal interviews. Many face-to-face surveys provide respondents with a card on which income categories are labeled by letters so that respondents merely call out a letter to the interviewer. In the Rand survey, the wording was as follows:

> We have four large categories of annual family income, A, B, C, and D. We would like you to estimate which of the following categories you and your immediate family would be in before taxes in 1975 . . .
>
> Group A—Under $10,000
> Group B—Between $10,000 and $15,000
> Group C—Between $15,000 and $20,00
> Group D—Over $20,000

A number of experienced telephone interviewers volunteered that although they usually felt uncomfortable asking financial questions, this wording removed some of the awkwardness.

This point leads to the third explanation for the higher completion rate—interviewer attitude. As many commentaries have pointed out, the mental attitude and approach of interviewers is crucial. The importance of the income question was stressed in interviewer training as well as during subsequent monitoring of interviews. If interviewers feel that a question is an invasion of privacy, they can easily encourage refusals by a tone of voice that communicates their sense that the question is personal and need not be answered. In addition to noting this problem

[20] The reader should keep in mind that a certain proportion of eligible respondents genuinely do not have any sense of total annual family income and must legitimately say "don't know."

Table 9

WILLINGNESS TO SUPPLY 1975 FAMILY INCOME CATEGORY

City	Refused to Say	Don't Know	Chose Income Range	Sample Size
Greensburg	6.4%	3.4%	90.2%	(200)
Johnstown	5.4	3.7	90.9	(514)
McKeesport	8.8	5.0	86.2	(502)
Pittsburgh	7.0	4.2	88.8	(401)
Williamsport	6.2	3.5	90.3	(402)
Bethel Park:				
Telephone Survey	9.3	3.3	87.4	(215)
Personal Survey	6.5	1.5	92.0	(200)
Wilkinsburg:				
Telephone Survey	5.5	3.5	91.0	(199)
Personal Survey	8.5	4.0	87.5	(200)

in training, we placed the question at the very end of the interview. By this point, most interviewers had established a business-like yet personal rapport that continued through the income question.

Having a fairly complete data set as a result of these steps, we can then ask how closely the telephone and personal surveys in the seven cities represented actual city median incomes. Inflation and the absence of current city-by-city income data required projections based on economic trends.[21] The extent to which median family income in the telephone and personal interview surveys approximated the projected medians in each city is reported in Table 10.

We should emphasize that these estimates of population income are a severe test of telephone surveys. They test the accuracy of telephone interviewing at a point where traditional views would have us expect telephone data to be the most unreliable. The final survey estimate on any question is shaped by the joint effects of sampling procedures, refusal rates, and response reliability. Thus, we can examine the cumulative effect as it relates to three important criticisms of telephone interviewing: telephone survey samples underestimate low income populations; refusal rates further bias the sample; and telephone respondents will not provide answers to sensitive questions—particularly income questions—over the telephone. If these criticisms have any validity, it should be apparent here. But the

[21] Reasonable projections of the population medians were possible because only one other state has, since 1960, more closely matched national personal income per capita than has Pennsylvania. In 1960, per capita personal income in Pennsylvania was 102.1 percent that of the United States as a whole. In 1970, the figure was 100.1 percent, and the 1975 estimate was 100.7 percent. *Statistical Abstract of the United States 1976*, p. 402. Furthermore, the per capita income ratios of the cities under study to the state of Pennsylvania held constant during the early 1970s with the exception of Wilkinsburg. "1973 Population and 1972 Per Capita Income Estimates for Counties, Incorporated Places, and Selected Minor Civil Divisions in Pennsylvania," *Current Population Reports, Population Estimates and Projections*, Series P-25, No. 583 U.S. Department of Commerce, Bureau of the Census. The ratios of city to Pennsylvania per capita personal income in 1969 and 1972, respectively, were: Bethel Park, 1.20, 1.18; Greensburg, 1.06, 1.08; Johnstown, .80, .79; McKeesport, .91, .92; Pittsburgh, 1.00, .97; Wilkinsburg, .90, 1.18; and Williamsport, .85, .81.) Given the stability of these relationships the ratio of the city-to-national median family income in the 1970 Census ($9,590) was used to project 1975 median family income in each city from the 1975 estimated national median family income ($13,719). The sample medians for each of the seven Pennsylvania cities were estimated by interpolation of the grouped data.

Table 10

COMPARISONS OF TELEPHONE AND PERSONAL SURVEY ESTIMATES OF 1975 MEDIAN ANNUAL FAMILY INCOME

City	Rand Survey Estimates	Census Projections[a]	Difference
Telephone Survey:			
Greensburg	$14,120	$13,445	+ $ 675
Johnstown	12,735	11,524	+ 1,211
McKeesport	12,591	12,210	+ 381
Pittsburgh	13,096	12,621	+ 475
Williamsport	12,402	11,798	+ 604
Bethel Park:			
Telephone Survey	18,735	18,932	- 197
Personal Survey	17,313		- 1,619
Wilkinsburg:			
Telephone Survey	12,500	13,170	- 670
Personal Survey	11,221		- 1,949

[a]The 1975 estimates are based on multiplying the 1975 U.S. median family income of $13,719 by the following: Greensburg, .98; Johnstown, .84; McKeesport, .89; Pittsburgh, .92; Williamsport, .86; Bethel Park, 1.38; Wilkinsburg, .96 These are the ratios of the 1969 median family income for each city to the 1969 U.S. median.

telephone survey data are remakably close to the Census-based projections. Income data elicited on the telephone are within $700 of the Census-projected median family incomes in every city except Johnstown where the difference was $1,211. The telephone samples' reported income was slightly higher than projections in five cities and was slightly lower in two others.

Comparing the telephone and personal survey data in Table 10, we find that the telephone data provide better estimates. Both personal survey estimates are further from the projected medians than the worst telephone survey estimate. If the median income projections are roughly accurate, the surveys offer no evidence that personal interview estimates of income are preferable to those obtained using the telephone. The comparative effects of more extensive financial probing await further tests and cannot be addressed with the Pennsylvania data. The review of prior research findings and the implications of the Rand survey suggest that detailed financial status questions may be one area where skepticism about the use of telephone interviewing is justified. However, it is clear that reliable data about family income can be obtained in broad terms over the telephone.

SOCIAL DESIRABILITY IN SURVEY RESPONSES

A concern for bias due to social desirability of answers to survey questions reverses the burden placed on the two survey methods. Thus far we have been exploring the criticism that telephone surveys lead to nonresponse bias and other distortions on income questions. A concern regarding personal interviews is that personal presence, eye-to-eye contact, and "rapport" lead respondents to want to

appear in a more favorable light and to select answers that are more socially attractive.

Available reseach gives only limited support for this criticism of personal interviews. Some studies find no differences. Wiseman compared responses given to identical telephone, personal, and mail questionnaires administered to adults in a suburb of Boston. There was little difference in the personal and telephone answers to the eleven public issue questions. The only significant differences related to the mail questionnaire which, on two items, found more "socially undesirable" opinions in favor of legalizing abortion and promoting birth control among unmarried people.[22] Support for the equivalency of telephone and personal interviews also came from Colombotos' reports of two surveys of physicians concerning sensitive personal and professional questions. Colombotos was especially interested in any tendencies toward socially desirable responses in personal interviews. The larger survey analyzed 408 personal and 340 telephone interviews and the two methods produced very similar results. The smaller of the two surveys, which compared 68 personal with 60 telephone interviews, found only minor differences in personal interview responses in the direction of social acceptability.[23] Even though the surveys focused on such topics as altruistic versus monetary professional motivations, controversial medical practices, and devoutness of religious faith, Colombotos concluded that "data from two surveys of physicians show that there are essentially no differences in the proportions who give socially acceptable responses according to whether they are interviewed in person or by telephone."[24]

On the other hand, some studies have found differences in telephone and personal responses to certain questions in the direction of more socially conservative answers in the face-to-face interviews. Although most of the items in Hochstim's surveys produced comparable answers, women were asked about their consumption of alcoholic beverages and many more said they never drank at all when interviewed in person than in telephone interviews or mail questionnaires.[25]

Rogers contrasted city election records with reported voting among low income New York City respondents.[26] Personal interview overreporting was greater than in telephone interviews. Rogers used New York voting records to validate her findings, and found a tendency to give socially desirable answers was associated with interviewer style ("warm" and friendly versus "cool" task oriented and businesslike) as well as interview mode. This finding suggests differences in social desirability effects may come from a reduced propensity of most telephone interviewers to try to become "warm" as opposed to "inherent" differences between personal presence and telephone communication. In either event, at least some research indicates that the social involvement of face-to-face interviews may slightly skew the responses for certain questions toward more "respectable" answers.

Comparative Responses to Political Attentiveness Questions

To focus on comparative responses rather than differences attributable to sam-

[22] Frederick Wiseman, op. cit.

[23] John Colombotos, "Personal Versus Telephone Interviews: Effect on Responses," *Public Health Reports*, Vol. 84, No. 9, September 1969, pp. 773-782.

[24] Ibid., p. 782.

[25] Hochstim, op. cit.

[26] Rogers, op. cit.

pling, subsequent analysis of the Wilkinsburg personal and telephone samples excludes black respondents.[27] Respondents in Bethel Park and Wilkinsburg were asked about a number of matters which involve their news attentiveness and civic-mindedness. Good citizenship is strongly associated with community participation, voting, and following the news. This norm pulls respondents in the direction of overreporting such activities. For example, it was noted earlier that voting in prior elections is consistently overreported. Several questions from the Pennsylvania survey allow a test whether respondents give more civic-minded, socially desirable answers in personal interviews than over the telephone.

Table 11 presents the levels of chi square significance for differences in the responses to personal and telephone interviews for 16 political, organizational, and media questions. There were no differences of consequence on any of the political behavior or group affiliation questions. Under both kinds of interviews, respondents were equally likely to have strong party identification, to recall having voted in past elections, to admit having voted for McGovern or Nixon, to say they had registered or had made up their mind in the 1976 election, and to assert they were active members of at least one local organization.

The major differences in reported behavior came in two media questions. There were no significant differences in Wilkinsburg, but in Bethel Park the respondents interviewed in person were more likely to say they regularly followed the news. While 27.8 percent of the telephone respondents were prepared to say they never watched national television news, only 15.5 percent of the personal interviews contained that response. Also, half (50.5 percent) of the people interviewed face-to-face claimed they watched local television news every day compared to one-third (34.4 percent) of those interviewed by telephone.

Overall, these results indicate that the two survey methods produced extremely similar responses. Sometimes telephone interviewing may lead to slight reductions in socially desirable and presumably more distorted answers, as in the case of the news viewing questions. Any consistent differential effect due to social desirability is fairly subtle, however, and does not emerge on most items. Evidence from this and earlier studies on socially desirable responses suggests that this particular advantage of telephone interviewing is likely to be a very small one.

QUESTION STRUCTURE AND PACING EFFECTS

The preceding discussion has concluded that the telephone survey holds no substantial disadvantage in asking basic income data in categorical format and seldom has much advantage in reducing social desirability. Additional evidence of the general comparability of telephone and personal interview responses comes from a variety of questions in the Rand Pennsylvania survey which were of a straightforward and essentially factual nature.

Table 12 includes the telephone and personal response comparison for 12 questions asked in both Bethel Park and Wilkinsburg. All of these questions were succinct and primarily factual. There were no significant differences in responses elicited by the two methods in either city. To the extent some of these questions,

[27] The greater number of blacks in the Wilkinsburg telephone sample was the only significant difference between the telephone and personal surveys in either city.

Table 11

TELEPHONE AND PERSONAL RESPONSE DIFFERENCES: POLITICS, MEDIAN, AND ORGANIZATIONS

Interview Question	Subject[a]	Chi Square Significance	
		Bethel Park	Wilkinsburg
31	Short party identification (Democratic, Republican, Independent)	N.S.	N.S.
31-33	Long party identification (strong Democratic, strong Republican)	N.S.	N.S.
42	Voted in 1972?	N.S.	N.S.
42a	Nixon or McGovern?	N.S.	N.S.
44	Registered in 1976?	N.S.	N.S.
45	Ford or Carter?	N.S.	N.S.
46	If election held today,	N.S.	N.S.
43	Recall voting in local election in 1975?	N.S.	N.S.
22	Frequency of discussing Bethel Park/Wilkinsburg politics	N.S.	N.S.
26	Frequency of discussing national politics	N.S.	N.S.
47	Frequency of discussing Carter and Ford politics	N.S.	N.S.
27	Active member of group	N.S.	N.S.
28	Number of active memberships	N.S.	N.S.
5	National TV news viewing frequency	.05	N.S.
6	Local TV news viewing frequency	.01	N.S.
10	Newspaper reading frequency	N.S.	N.S.

[a]See Appendix B for full question wording.

such as respondent's education, might also lend themselves to suggest more socially desirable responses, they provide further support for the absence of strong differential effects associated with that factor.

These results also confirm a point which is rarely disputed: Simple factual information can be obtained using telephone interviews and the results are comparable to those gained in person. In fact, the data in Tables 11 and 12 constitute support for this same proposition extended to the subject of income, political and communications activities, despite varying degrees of sensitivity.

In contrast to this general pattern, systematic differences did emerge in one area which could not be easily attributed to subject sensitivity or socially desirable

Table 12

INTERVIEW MODE DIFFERENCES IN RESPONDENT CHARACTERISTICS

Interview Question	Subject	Chi Square Significance	
		Bethel Park	Wilkinsburg
3	Television ownership	N.S.	N.S.
4	Cable television subscription	N.S.	N.S.
7	Watch early or late local TV news	N.S.	N.S.
8	Preferred local TV news station	N.S.	N.S.
49	Respondent's age (in decades)	N.S.	N.S.
52	Occupation of head of household	N.S.	N.S.
54	Education of respondent	N.S.	N.S.
56	Respondent's marital status	N.S.	N.S.
57	Number of children in household	N.S.	N.S.
58	Number of adults in household	N.S.	N.S.
59	Respondent's role in household (e.g., son, mother-in-law, etc.)	N.S.	N.S.
60	Annual family income	N.S.	N.S.

responses. The Pennsylvania data included a series of questions on citizen attitudes towards their obligation to be informed. Respondents were asked to say if they strongly agreed, somewhat agreed, somewhat disagreed, or strongly disagreed with five statements. One question was a standard political efficacy measure, and the other four were paired items, two positive, and two negative, seeking to measure obligations and pressures to follow news. Two of these statements produced divergent telephone and personal responses in Bethel Park. Four of the statements produced inconsistent responses in Wilkinsburg, including two at the .01 level. These differences demanded some explanation, but their nature, direction, and inconsistency could not be accounted for by question sensitivity or social desirability.

One explanation was found in the information gathered in debriefing the interviewers who conducted the survey. Ten people who had conducted telephone interviews and ten who had done personal interviews were asked whether any parts of the instrument proved difficult to administer and confused the respondents. None of those who had interviewed face-to-face mentioned the agree-disagree series, while eight of the ten who had interviewed by telephone mentioned that series of statements as troublesome. During the monitoring of the telephone interviewers at the central WATS facility, it also became apparent that the statements and the four-fold response categories were more awkward than other questions.

Inspection of the tables suggested that in several instances the distinctions appeared to emerge from the distribution of "strongly" and "somewhat" responses rather than between "agree" and "disagree". For example, Wilkinsburg opinions on one statement are shown in Table 13. When the responses are collapsed so that the two agree categories are combined and the two disagree categories are com-

Table 13

MY FRIENDS PAY A LOT OF ATTENTION TO THE NEWS
(percent)

Wilkinsburg	Strongly Agree	Somewhat Agree	Don't Know	Somewhat Disagree	Strongly Disagree	(n)
Personal	46.1	28.6	7.8	11.0	6.5	(154)
Telephone	36.6	44.3	3.1	13.0	3.1	(131)

Chi square significance = .025

bined, there is no significant difference in the likelihood of personal or telephone respondents to agree with the statement. Table 14 presents the merged columns. If the categories of all the agree-disagree statements are collapsed as they were in Table 14, most of the differences disappear. Of 10 comparisons (contrasting telephone and personal interviews for each of five statements in two cities), 3 rather than 7 are still statistically significant and only one at the .01 level.

Table 14

COLLAPSED: MY FRIENDS PAY A LOT OF ATTENTION TO THE NEWS
(percent)

Wilkinsburg	(Collapsed) Agree	Don't Know	(Collapsed) Disagree	(n)
Personal	74.7	7.8	17.5	(154)
Telephone	80.9	3.1	16.0	(131)

Chi square significance = .194

Another set of differences between the personal and telephone surveys not explainable by question sensitivity or social desirability was found for a series of knowledge questions. Eleven questions were designed to tap the respondent's ability to identify public officials at the national, state, and local levels. There were no statistically significant differences between the success of Wilkinsburg telephone or personal interview respondents in correctly naming incumbents. In Bethel Park, however, personal interview answers consistently surpassed telephone responses in the proportion of accurate identifications. In four instances (city council, school superintendent, Secretary of State, U.S. Representative), the differences were significant at last at the .05 or .01 level. Two others (local police chief and Pittsburgh police chief) were significant at the .10 level, and the differences in the remaining five were all the same direction with personal interview answers scoring higher. Table 15 shows the proportion of correct identification for each office by interview mode and city type.

A possible explanation for the superiority of personal interview responses in Bethel Park is the leisurely pace at which those interviews were conducted. Table

Table 15

RESPONDENT IDENTIFICATION OF PUBLIC OFFICIALS BY INTERVIEW MODE
(percent)

Interview Question	Office	Bethel Park			Wilkinsburg		
		Personal	Telephone	Difference	Personal	Telephone	Difference
12	Mayor	76.5	74.9	+ 1.6	40.3	34.1	+ 6.2
13	Council	44.5	30.2	+ 14.3[a]	27.9	19.7	+ 8.2
14	Police Chief	44.0	34.9	+ 9.1	13.6	13.6	0
15	Superintendent	35.5	24.7	+ 10.8[b]	18.8	15.2	+ 3.6
15a	Pittsburgh Mayor	95.5	92.6	+ 2.9	92.9	93.2	- 0.3
15b	Pittsburgh Police Chief	40.0	30.7	+ 9.3	26.6	32.6	- 6.0
16	Governor	94.5	91.6	+ 2.9	90.3	81.8	+ 8.5
17	Lt. Governor	47.0	43.7	+ 3.3	34.4	38.6	- 4.2
18	U.S. Chief Justice	26.5	23.3	+ 3.2	22.7	19.7	+ 3.0
19	Secretary of State	83.5	69.3	+ 14.2[a]	66.2	62.1	+ 0.1
20	U.S. Representative	50.5	37.7	+ 12.8[a]	25.3	28.0	- 2.7

[a].01.
[b].05.

16 reports interview times for Bethel Park and Wilkinsburg telephone and personal interviews. The median telephone interview in Bethel Park took 14 minutes, while the median personal interview was 25 minutes. In Wilkinsburg, on the other hand, the median length of both the personal and the telephone interviews was 15 minutes.

Slower-paced Bethel Park personal interviews may have allowed respondents more time to reflect on the correct answers to the political knowledge questions. On the telephone, monitoring found the pace of asking the knowledge questions to be a brisk one and, if respondents did not immediately know the identity of a particular office-holder, the telephone interviewers moved on to the next question. Similarly, the faster pace of the telephone interview may have inhibited respondents from asking for repetitions of the more complex agree-disagree statements and may have discouraged longer deliberations on their response. Groves in his account of the University of Michigan Survey Research Center's telephone and personal interview comparison surveys, has also observed "the tendency toward faster-paced interviews" over the telephone.[28]

The possibility of pacing effects raises two important issues. First, it suggests that personal interviewing may contain a differential bias caused by a relationship between social class and more leisurely paced interviews. If interviewers spend

[28] Groves, op. cit., p. 3.

Table 16

LENGTH OF PERSONAL AND TELEPHONE INTERVIEWS, BY CITY

Length of Interview in Minutes	City			
	Bethel Park		Wilkinsburg	
	Telephone	Personal	Telephone	Personal
9-10	9.8%	0.5%	6.0%	4.5%
11-12	20.0	2.0	16.5	2.5
13-14	24.5	2.5	23.4	13.0
15-16	23.7	11.0	18.6	36.5
17-19	15.4	2.5	14.5	8.5
20-24	5.1	24.0	16.5	21.5
25-29	1.5	22.0	3.5	7.0
30-34	--	30.0	--	3.5
35-39	--	4.0	0.5	0.5
40-55	--	1.5	--	2.0
55 +	--	--	0.5	0.5
	100.0%	100.0%	100.0%	100.0%

more time in pleasant and affluent homes and neighborhoods like those in Bethel Park, then the pace of the interview may affect the nature of responses and lead some respondents in such homes to appear more knowledgeable and give more socially desirable responses. If this differential bias is generally present, it would pose problems in interpreting findings about social class based on personal survey data.

Second, the faster pace of telephone interviews indicates that questions which may necessitate more deliberation by many respondents should be approached with great care. Certainly any question calling on the respondent to reflect should be emphasized in interview training, and interviewers should be taught to be conscious of the pressure the telephone interview places on the respondent to give a quick answer. But, more generally, the typically rapid pace of telephone interviews compounds difficulties associated with complex survey questions and constrains the type of questions that can be asked. Thus, there appears to be a serious problem with adapting to the telephone certain kinds of intricate scales, projective statements, and similarly involved items.[29] One can monitor comprehension of questions at the central WATS facility, and if very many respondents cannot understand an item the first time it is read and request that it be repeated, then there are likely to be problems in the reliability of answers to that question.

QUESTION STRUCTURE NOT SUBJECTS

This review of the reliability of telephone survey data suggests that concern with response bias to sensitive questions can be redirected to concern with question complexity and pacing effects. With the notable exception of extensive financial probing, there were no areas where respondent sensitivity prompted any more

[29] Also see Groves' comparison of telephone and personal responses on scales. op. cit.

nonresponses or significantly different responses over the telephone than were obtained in personal interviews. Respondents provided comparable answers to questions about political attitudes and behavior, interpersonal relationships, communications and media involvement, community activity, health status, criminal victimization, personal demographics, and in broad terms, income.

The propensity of some respondents to give more socially acceptable answers affects all interview modes. Telephone and personal interview responses are likely to be similar even on most questions involving alternatives that are quite socially desirable. Occasionally, however, prior research and Rand's Pennsylvania survey encountered modest differences which did appear to be associated with social desirability and the tendency to give more civic-minded replies in personal interviews. To the extent this pattern may sometimes emerge, it represents an advantage accruing to telephone interviews.

Instead of stressing issues of subject matter (aside from financial data) and relative social desirability, this analysis has suggested that greater attention should be directed toward the structure and difficulty of the questions asked, along with the speed and pacing of the interview. Although experience has taught the merits of unambiguous, straightforward, and simple survey questions, social scientists sometimes feel they must use complex, lengthy constructions with multiple alternative response categories. Findings reported here demonstrate that there is justifiable skepticism regarding the adoption of intricate items for the telephone survey use, and indicate that further research is needed on this issue.

Analysis of the Rand Pennsylvania study has also raised the possibility of differences in telephone and personal survey responses related to the speed and pacing of the interviews. The telephone interview pace may be an inherent constraint on the manner in which certain kinds of questions can be asked. On the other hand, the difficulties created by the tendency of telephone interviews to be faster paced may be subject to correction through the proper use of probes and interviewer training. Again, attention of methodological studies might usefully be directed to the structure and pacing of questions.

4. QUALITY IMPLICATIONS OF SURVEY ADMINISTRATION

Telephone surveys under most circumstances provide representative samples and reliable responses, but there remains another set of important issues related to the interview as a whole and the management of its administration. Here we find one limitation, and a number of significant advantages.

The limitation is simply that one cannot easily design a telephone survey that approaches the length of personal interviews. To be sure, there a few examples of extraordinarily long telephone interviews which are said to have been successful. Rogers reports that her telephone reinterviews with respondents who had previously been interviewed in person lasted 50 minutes.[1] Elite interviews on the telephone have gone as long as an hour.[2] Nevertheless, most telephone interviews are limited to periods of much shorter duration.

A poll of academic survey research organizations with experience conducting telephone interviews found some groups estimating the maximum feasible length of a telephone interview as 8 to 10 minutes, while others said the maximum feasible time was 45, 60, and 75 minutes. The median estimate of the maximum length was 30 minutes. And in actual practice, typical telephone interviews were designed to last between 10 and 20 minutes.[3]

Our own experience leads us to concur that this range is optimum. Monitoring of the Pennsylvania survey often revealed signs of restlessness and fatigue among respondents as the interview wore on even though the median length was only 15 minutes, and few exceeded 20 minutes. As Groves also noted, respondents increasingly asked "about how much longer the interview would last."[4] Throughout the interview there was a small but steady attrition. Every additional minute more respondents unilaterally terminated the interview. By the end of the interview, four percent of those who had begun answering quetions had broken off the interview. Analysis of the incomplete interviews revealed that these terminations tended to concentrate around each transition point. Each time the interview would shift from one set of questions to another, some respondents would break off. This breakoff rate is consistent with rates reported elsewhere, but we do not know if the attrition is simply a linear function of time, or whether it would rise dramatically for very long interviews. Surveys cited elswhere suggest that breakoff rates of initially cooperative respondents range from one to four percent, but that experience is also for reasonably short interviews.[5] It would be useful to have additional documentation on the damage from breakoffs and fatigue in longer telephone interviews.

Steps can be taken to circumvent this problem of a time limitation. Social

[1] Rogers, op. cit.

[2] Colombotos, op. cit.

[3] "Interviewing in Telephone Surveys," *Survey Research* January 5, 1973, pp. 9-13.

[4] Groves, op. cit.

[5] Breakoff rates from several studies are cited in Don Dillman, Jean Groton Gallegos, and James H. Frey, op. cit. Breakoff rates of personal interviews are non-existent or neglible, but it is not so clear that there are not significant fatigue effects in personal interviewing.

scientists with an extensive research agenda to put into a questionnare should examine the possibility of split halves of the sample so that some lower priority questions could be divided between two forms of the questionnaire. Large sample sizes coupled with random sampling procedures would make it possible to divide the questions even further into multiple forms. If the questionnaire is still a long one, however, the telephone looses much of its appeal as a medium for data collection.

FLEXIBILITY AND QUALITY CONTROL

Other features of telephone surveys provide opportunities for flexible management and quality control superior to those found in the administration of personal surveys. It is very important to recognize that social scientists have unique opportunities to improve and maintain quality with telephone interviewing by being able to remove some interviewer obtrusiveness, to improve question administration, and to monitor interviewer performance. In each respect, social scientists can improve data quality in ways that are generally beyond reach with personal interviews.

Minimizing Interviewer Obtrusiveness and Bias

In telephone interviewing, the absence of visual contact has valuable side benefits: The respondent cannot see the interviewer's appearance and mannerisms which might intrude. Interviewer race, social class, sex, and other characteristics which can interact with respondent attitudes are minimized.[6] Likewise, respondents are not distracted by seeing their answers being recorded on the questionnaire.

When telephone calls are assigned randomly, what interviewer bias that does exist is distributed in ways that will not affect the analysis. Bias related to telephone interviewers (respondent reactions to their voice and tone, interviewer question reading, and coding ideosyncracies) is distributed randomly. Estimates of population characteristics would of course be affected but each bias would not be compounded with particular clusters and types of respondents as they would be in personal interviews.

Another source of interviewer bias that is minimized by telephoning is the advantage of not being exposed to physical risk. When the interviewer can call rather than visit high crime areas, it eliminates worry about the safety of the interviewers. That capability removes a pressure on the interviewers that might lower completion rates in such neighborhoods.

Question Administration and Monitoring

Alterations in the questions and the conduct of the survey are facilitated in telephone interviewing. Even the best-planned pretests do not always uncover all

[6] Stanley L. Payne, "Some Advantages of Telephone Surveys," *Journal of Marketing*, Vol. 20, January 1956, pp. 278-281; on the general problem of interviewer effects, see also Barbara Snell Dohrenwend, John Colombotos, and Bruce P. Dohrenwend, "Social Distance and Interview Effects," *Public Opinion Quarterly*, Vol. 32, Fall 1968, pp. 410-422; Howard Schuman and Jean M. Converse, "The Effects

the problems with a new instrument. Working at a central telephone facility, the researcher can listen in to calls to hear how well the questions on the final instrument are obtaining the content they were designed to tap. This ability to actually hear interviews can also greatly enhance the researcher's intuitive grasp of the survey content.[7]

Monitoring also identifies weak interviewers and areas where interviewer training may have been inadequate. On the second day of the Pennsylvania survey, monitors discovered that two of the telephone interviewers had misunderstood the intended use of probes in four questions. They were failing to probe as indicated in two questions, but making too many probes for two questions later in the interview. Had they continued unchecked, certain answers would have been inflated, but the error could not have been discovered from the marginals. Monitoring permitted an immediate correction. Additionally, since other interviewers also might have misinterpreted those particular instructions, the supervisor was able to carefully reiterate and emphasize them for all interviewers.

Another illustration of the flexibility of central telephone interviewing, and its problem-solving advantages, occurred two weeks into the Pennsylvania survey. One of the survey questions asked respondents the name of the city police chief. In mid-September, the police chief of Johnstown resigned. In the field, interviewers on their own would not know how to cope with the coding of responses identifying the newly appointed chief. With centralized telephoning, however, it was possible to learn about and deal with the change immediately. The telephone supervisor was able to quickly devise a new set of categories and provide copies to all interviewers. The revised answers included categories indicating whether the respondents did not know of the change; knew the change, but did not yet know the name of the new police chief; or knew the name of the new chief. A problem that might have taken several days to solve in a personal survey was handled within the hour and provided instead a useful variable measuring diffusion of information.

Other advantages of the centralized management of telephone surveys relate directly or indirectly to the final sample. The first and most obvious benefit is that quotas for screening questions and within-household selection procedures can be closely monitored. If the selection grid is producing a distorted sample, procedures and quotas may be quicky refined. With personal interviews, flexibility is limited both by the lag time between actual interviews and their being collated at a central point and by the difficulty of communicating changes to all of the dispersed staff of interviewers. Unlike central WATS interviewing, it is much harder to detect a poor question, a poor interviewer, or failure in the quota selection system.

Another special asset of telephone sampling is its random distribution of calls. One of the unique advantages this brings is the opportunity to view the survey as constituting a succession of random sample surveys. To use the sample in this way requires that care must be taken in two respects. First, one must sustain the same rates of sampling in all areas so that calls in each city, neighborhood, and telephone

---

of Black and White Interviewers on Black Responses in 1968," *Public Opinion Quarterly*, Vol. 35, Spring 1971, pp. 44-68; Willis J. Goudy and Harry R. Potter, "Interviewer Rapport: Demise of a Concept," *Public Opinion Quarterly*, Vol. 39, Winter, 1975-76, pp. 529-543.

[7] Interpretation of what is mandatory in ensuring respondent privacy and anonymity varies. For example, California state law prohibits listening to the respondents' side of the conversation, and firms in that jurisdiction can monitor only the interviewer. In other areas, it is legal to listen to the entire interview.

exchange are completed at the same rate. Second, one must exhaust all callbacks for a set of calls, and not let them drag out through subsequent periods. In the Rand Pennsylvania study, interviewing in all seven cities was paced together so that the final sample would be evenly distributed across all cities during each week of the survey. Dividing the sample into three ten-day periods therefore results in three independent random samples of respondents for each period. By way of illustration of the close similarity of the samples obtained in the three periods, the proportion of black respondents for each period was 9.7, 8.3, and 10.1 percent respectively.

Taking steps to insure comparability of time-based samples allows one to explore interesting substantive issues, and to provide a valuable methodological tool in evaluating the impact of unanticipated events occuring during a survey. If, for example, a survey is being conducted over the course of month prior to an election, each week's random sample can be analyzed for trends during the campaign. In the event that a crisis suddenly emerges while a survey is in the field, the social scientist must face the challenge that any findings are an artifact of that crisis. For example, a finding that the public has an unexpected level of concern for environmental questions could be attributed to a temporary interest caused by a dramatic oil-spell. By comparing data collectd before and after the oil-spill, this alternative explanation could be addressed directly. These features could be built into the design of personal surveys, but only with difficulty. Establishing parallel pacing within clusters would be much more difficult and that constraint would increase survey costs. As a practical matter, one would probably achieve this end by interviewing independent probability samples of clusters in sequential waves. Lag times in knowing day-to-day completion rates by cluster would make the process awkward to manage and each wave would have larger sampling error due to the cluster structure.

COST

Despite its importance, we have held a discussion of the cost factor until last because the emphasis on cost has tended to obscure the debate over the merits of alternative survey methods. Market research initially moved to the telephone because it was cheaper, and the issue has often been seen as a tradeoff problem. There has been an impression that one sacrifices quality for substantial savings. Social scientists, not prepared to relax quality standards, have consequently been less attracted to telephone-based research. Since the evidence supports the view that there is no overall loss in quality, however, the question is not one of tradeoffs. It is instead simply a direct cost comparison of two methods that for most purposes produce results of equivalent quality. When the costs are compared directly, the only conclusion is that when the telephone survey can be used it is a valuable way of reducing research costs at no overall loss in quality.

Telephone interview costs at their most expensive are only about half that of personal interviews, and the difference in favor of telephone surveys is usually greater.[8] However, comparative cost data on telephone versus personal interviews

[8] Data on comparative costs may be found in Joseph R. Hochstim, op. cit.; S. Stephen Kegeles, Clinton F. Fink, and John P. Kirscht, op. cit.; Hilary G. Fry and Sylvia McNair, op. cit.; and Alfred J. Tuchfarber and William R. Klecka, op. cit.

varies considerably depending on the specifications of the surveys. Telephone interviewing costs are especially sensitive to specifications regarding: (1) any initial respondent screening and the within-household respondent selecion process, (2) number of callbacks, (3) estimates of refusal rates, (4) length of interviews, (5) sample size, (6) costs of WATS lines extending to the sampled jurisdictions, and (7) pure random-digit or added-digit dialing.

Cost data for different surveys are difficult to compare because studies calculate start-up costs, overhead, and other factors differently. Completed telephone interviews in one pair of the comparative surveys discussed by Hochstim cost half that of completed personal interviews. Completed telephone interviews in other parallel surveys reported by Hochstim averaged costing less than two-thirds that of in-person interviewing.[9] Coombs and Freedman estimated savings of approximately 60 percent when using telephone rather than personal interviewing.[10] Tuchfarber and Klecka estimated comparative costs per household for interviews with each member over age 13 of 1,000 households to obtain crime victimization, attitudinal, and demographic information. Costs per household using personal interviews were projected at over three times that of telephone interview expenses.[11] A rough disaggregation of the Rand Pennsylvania subcontract costs puts completed personal interviews at roughly $25 each while completed telephone interviews were about $11.

This cost ratio advantage with telephone surveys enables researchers to further improve the quality and quantity of the data collection. For the same costs, at least double the number of interviews could usually be obtained using telephone interviewing and the precision of the sample estimates would be improved.

Costs are also attractive in terms of callbacks. Personal interviewers try to contact all the selected respondents in a cluster, and then on subsequent trips those who had not been interviewed on the first attempt. By the second and third callbacks, personal interviewers must drive across town to each neighborhood to reach only one or two respondents. The ratio of time spent traveling as opposed to interviewing goes up sharply, pushing up overall costs. Because the incremental costs of each callback are so much lower with the telephone, the researcher can afford to pursue hard to reach respondents at far lower costs. The optimum number of callbacks depends on the population being interviewed, and the available evidence suggests that four calls (the initial plus three callbacks) should be specified for a general population survey.[12] But whether it is two, three, or more, the marginal cost of improving quality standards with additional callbacks is more attractive wih telephone surveys. Cost savings also allow researchers to incorporate additional devices aimed at improving data quality, such as more extensive interviewer training and briefings, higher paid and more experienced interviewers, full-time supervisory monitoring, and more survey pretests.

[9] Joseph R. Hochstim, op. cit.

[10] Lolagene Coombs and Ronald Freedman, op. cit.

[11] Alfred J. Tuchfarber and William R. Klecka, op. cit.; Cost data may also be found in S. Stephen Kegeles, Clinton F. Fink, and John P. Kirscht, op. cit.; Hilary G. Fry and Sylvia McNair, op. cit.

[12] For a further discussion of callbacks see William G. Dunkelberg and George S. Day, "Nonresponse Bias and Callbacks in Sample Surveys," *Journal of Marketing Research*, Vol. 10, May 1973, pp. 160-168; Peter Braun and Freda Marsden, "Effectiveness and Costs of Interviewer Callbacks in a National Survey," a paper prepared at the Survey Research Centre, York University, Toronto, Canada, July 1976; and Alfred J. Tuchfarber and William R. Klecka, op. cit.

CONCLUSIONS

Findings from the Rand Pennsylvania surveys are consistent with other recent research, leading to the central conclusion of this report: telephone surveys can provide representative samples of the general population, and can obtain reliable answers on sensitive topics. The telephone survey does as well as the personal survey for most purposes, and telephone surveys have a greater potential for a high degree of quality control and flexibility at attractive costs.

This is not to say that telephone surveys are a panacea for concerns about high refusal rates, social desirability bias, and other problems facing personal interviewing. These problems are inherent to all forms of survey research. But research has come a long way in establishing the general reliability and utility of telephone interviewing. In terms of the basic questions of sampling, response reliability, and quality control, the evidence regarding telephone surveys is sufficiently positive that researchers should feel free to use them for most general population studies. Findings of this and earlier research have indicated that social scientists should be highly skeptical about using telephone surveys during circumstances when (1) the particular target population has low levels of telephone penetration, (2) extensive income data must be collected, (3) the interview exceeds 30 minutes, and (4) intricately worded questions must be asked. Sensitivity to the limitations and advantages of telephone interviewing can enable researchers to exploit it fully as a valuable tool for the collection of social science data.

Looking Forward

In that spirit, the value of telephone surveying could be enhanced by action in two areas. Above all, journal editors, reviewers, and program officials in funding agencies and foundations should require greater specificity about research procedures. This review was hampered because many of the telephone studies cited in this report fail to outline survey procedures regarding several basic points. At a minimum, it seems to us, telephone-based research should include for the record: (l) telephone penetration or estimated penetration among the target population, (2) random-digit dialing or added-digit dialing techniques used, (3) within-household selection procedures, (4) refusals as a proportion of eligible respondents, (5) number of callbacks, (6) length of interviews, and (7) opening remarks. Until this information is reported on a regular basis, it will be difficult to develop a set of reasonable standards by which to judge proposed or completed research.

Second, those conducting methodological studies can begin to target on specific aspects of telephone surveys rather than continuing to replicate earlier work on the general comparability of telephone versus alternative survey methods. Several areas in particular need attention, and we would urge that comparative and experimental research be conducted on the following: (l) various strategies for initiating interviews that both inform respondents and secure their cooperation, (2) impact of different within-household respondent selection techniques on refusal rates and on sample bias, (3) reliability and refusals associated with requesting extensive income data, (4)breakoff rates and fatigue effects in telephone interviews over 20 minutes long with general population surveys, (5) issues in transferring scales and complex attitudinal items into telephone questions, and (6) determinants and

effects of fast interview pacing. This is not an exhaustive agenda for future research, but it represents our view that we should now look beyond the fundamental questions about sampling and reliability of telephone interviews. The telephone survey is a valuable research tool; the issue is how to make it even better.

Appendix A

THE PENNSYLVANIA SURVEYS OF MEDIA EFFECTS

The theoretical impetus behind the data collection involved testing a theory of media usage and political knowledge in a variety of media environments. Data on media habits and political awareness in different media contexts would also permit evaluation of the impact of the Federal Communications Commission's localism policies, a series of regulations requiring broadcast stations to foster community knowledge and awareness. Analyses of these substantive issues are reported elsewhere.

The concerns of the research led the survey to concentrate on a single major media market. Data had to be collected by monitoring and coding the content of local print and broadcast media available to each respondent, and that required concentrating on a few markets. In addition, it would help to hold constant factors related to state and regional culture. A theory of media environments suggested that we should find a market that had cities that were alike in as many ways as possible, but nonetheless represented the following media contexts: (1) a large central city with a major daily newspaper and several television stations, (2) a suburban city without its own daily newspaper or television station, (3) a suburban city with a strong daily newspaper but without a television station, (4) a city in or adjacent to a major market with its own television station and daily newspaper, and (5) a free-standing city some distance from these television stations. Additional criteria directed the choice away from twin-city markets, state capitals, and multiple-state markets. With these goals in mind, Rand staff reviewed the distribution of media outlets and the demographics of cities of comparable size in all the top television markets. Among the top 50 markets, the Pittsburgh area appeared to best meet these standards with the cities of Pittsburgh, Wilkinsburg, McKeesport, Johnstown, and Williamsport. Bethel Park was added to provide a different type of suburb for this methodological study. Greensburg was added because it was scheduled to receive a UHF television station, and created an excellent opportunity to collect baseline data for a future investigation. Together these seven cities provided a series of varied media cost environments along with generally similar demographic characteristics (Table 17).

THE TELEPHONE SURVEYS

The telephone surveys consisted of 2,642 interviews conducted, under subcontract from Rand, by the Opinion Research Corporation. The universe sampled was the total, noninstitutional, residential telephone household population, 18 years or older, in seven Pennsylvania cities. A technique for random probability sampling telephone numbers was utilized, which gave all numbers, listed and unlisted alike, an equal chance of selection. At the household level, quotas were assigned based on sex. From the O.R.C. WATS facility in Princeton, New Jersey, telephone interviewing began on September 7 and ended four weeks later on October 5, 1976.

Table 17

COMPARATIVE DEMOGRAPHICS FOR SEVEN PENNSYLVANIA CITIES

City	1970 Population	Change 1960-1970	% Black	% Foreign Stock	Median Education	% Manufacturing	% Professional & Managerial	Median Family Income	% Below $5,000	% Above $15,000	% With Telephone
Pittsburgh	520,167	-13.9	20	26	11.5	21	22	$8,787	22.2	16.1	91.5
Bethel Park	34,778	+ 47.1	0	18	12.7	23	40	13,218	5.9	37.2	98.7
Wilkinsburg	26,759	- 10.9	20	21	12.2	24	26	9,236	18.7	16.9	95.4
McKeesport	38,133	- 16.5	10	31	10.6	38	17	8,566	22.9	12.2	92.2
Johnstown	42,476	- 21.3	6	25	10.7	40	14	8,030	24.1	7.8	87.9
Greensburg	15,870	- 8.7	1	18	12.3	24	NA	9,383	NA	19.1	NA
Williamsport	37,918	- 9.6	3	9	12.1	39	19	8,253	21.9	11.6	89.6

SOURCE: U.S. Bureau of the Census, *County and City Data Book: 1972* (U.S. Government Printing Office, Washington, D.C., 1973). NA = Data not available.

Selection of Households within Cities: Added-Digit Dialing

According to the Census Bureau, almost nineteen out of every twenty households in these cities have telephones (Table 17). Pennsylvania Bell representatives estimated that as many as one quarter of all working residential numbers in these cities may not be listed in the telephone directory. In order to reach unlisted households, a modified form of random-digit dialing was employed. Telephone numbers were taken at random from the directories and constants added to the last digits to generate new numbers. Added-digit dialing can thus access those unlisted numbers scattered throughout the regular listed numbers, but avoids dialing numbers in unused exchanges.[1]

Selection and Contact of Respondents within Households

Telephone numbers were designated in advance for male or female respondents, 18 years of age or over.[2] Call sheets were initially designated half male and half female. Ten days after the survey began, the proportion of numbers designated for male interviews was increased substantially as it became apparent that male work schedules, refusal rates, and contact rates would seriously overrepresent women in the sample unless some action was taken. Quotas for completed male interviews were then assigned to each city to approximate Census estimates of each city's proportion of aduit males. (The problem of underrepresenting males is of course a common one).[3]

The substantive purposes of the research required that only those respondents who lived within the jurisdictional boundaries of the seven selected cities be interviewed. Most of the cities were relatively easy to isolate by their telephone exchanges. Wilkinsburg was more difficult to isolate because it shares seven exchanges with eastern Pittsburgh and adjoining cities. Only about one-fourth of the phones in the seven exchanges are Wilkinsburg numbers. For Wilkinsburg and the other cities as well, an initial screening question was employed to insure that the respondents did, in fact, reside within city limits of the appropriate city.

Up to five calls were made to each telephone number in order to interview an eligible respondent. Business, institutional, group-quartered, and non-English speaking numbers were excluded as well as those residing outside the selected cities and boroughs. Callbacks were made to all numbers which were unanswered, busy, or when the appropriate respondents were busy or not at home. The disposition of all calls is indicated in Table 18. Over half the uncompleted calls were to ineligible respondents and to households outside the survey cities. A net refusal rate of 28 percent is estimated by assuming that the refusal rate for respondents inside the city area and those outside the city limits were the same. The latter group were immediately screened out of the interview.

[1] See above, pp. 11-12.

[2] See above, pp. 13-16.

[3] See, e.g., Barbara Bryant, op. cit.; J. O. Eastlack, Jr. and Henry Assael, op. cit.; George C. Myers, "The Elusive Male: Some Methodological Notes on Survey Research Design," *Public Opinion Quarterly*, Vol. 38, Summer 1969, pp. 254-259.

Table 18

Disposition of All Telephone Calls

Call	q Completed	Called Back			Refused	Ineligible				Business
		Not Home/ Busy Resp.	No Answer	Busy Line		Reside Out of City	No Elig. Resp.	Language	Number not Working	
#1	12.1% (1,492)	12.6% (1,561)	28.4% (3,506)	0.5% (60)	10.2% (1,254)	14.5% (1,805)	2.8% (346)	0.3% (31)	14.5% (1,784)	4.1% (511)
#2	12.6 (629)	14.8 (739)	40.5 (2,026)	0.8 (40)	10.4 (519)	13.8 (691)	2.2 (112)	0.1 (7)	2.3 (115)	2.4 (120)
#3	10.6 (291)	14.7 (402)	47.3 (1,294)	0.7 (20)	8.7 (239)	10.8 (295)	2.8 (76)	0.1 (3)	0.7 (18)	3.5 (97)
#4	9.3 (150)	12.1 (195)	54.6 (880)	0.4 (7)	9.0 (145)	9.6 (155)	1.7 (28)	0.1 (1)	0.7 (11)	2.4 (39)
#5	8.2 (80)	11.4 (111)	61.4 (599)	0.0 (0)	7.0 (68)	7.2 (70)	2.5 (24)	0.1 (1)	0.7 (7)	1.5 (15)

PERSONAL INTERVIEWS

During the same period, personal interviews were also conducted in Bethel Park and Wilkinsburg. Within-household respondent selection procedures, number of callbacks, and the survey instrument itself were the same for both personal and telephone interviews. Two hundred face-to-face interviews were completed in each of the two suburban cities.

Besides the setting of the interview—the respondent's home versus over the telephone—only one other major difference was involved. As with virtually all personal interviewing, the study used cluster sampling the field in Wilkinsburg and Bethel Park. Addresses chosen at random from telephone directories provided twenty-five sampling points in each city. Starting with the next house to the right of that starting point, every other residence was listed as a selected household. Eight interviews were then completed in each cluster. In a step that goes beyond most personal surveys, the eight interviews in each cluster were collected by two different interviewers to reduce the compounding of potential interviewer bias with neighborhood effects. The refusal rate in Wilkinsburg was 18 percent, and 24 percent in Bethel Park.

There is one further use of the Rand Pennsylvania surveys which should be noted. The seven city samples may be viewed as a sample of urbanized western Pennsylvania stratified by city size. Weighting Pittsburgh respondents in the sample by a factor of 2 properly balances the proportions of major central city residents, small central city residents, urban fringe residents, and other urban place residents in the Pittsburgh and Johnstown urbanized SMSAs. The weighted merged sample closely approximates western urban Pennsylvania characteristics in terms of race, income, sex, and occupation.

Appendix B

MASTER QUESTIONNAIRE FOR THE SEVEN PENNSYLVANIA TELEPHONE SURVEYS

The questionnaire which follows is a composite of the instruments used for telephone surveys of all seven cities in the Rand Pennsylvania project. A few questions were asked in certain cities which were omitted in others, as indicated by notes in a separate typeface. As an illustration, this questionnaire gives Greensburg as the city name where the other cities would have been inserted in alternative versions. Greensburg cable and regular TV stations are used in question 8. Questions not asked of Greensburg respondents are also included, so that the composite includes all questions that appear on the forms used in other cities.

The Bethel Park and Wilkinsburg personal interview questionnaires were identical to the respective Bethel Park and Wilkinsburg telephone questionnaires except that the word "calling" was omitted from the first sentence of the introduction, and interviewers recorded cluster numbers, sequence, and location at the top of the questionnaire form on page 51.

51407
090776

TELEPHONE NO.: ( ) 0 [ ][ ][ ]-[ ][ ][ ][ ]
A. CODE EXCHANGE▲ NUMBER
(punch)

PHONE CALL RECORD FORM NO.: _____

DATE: _____ 1976 [ ][ ] DAY # (punch)

TIME STARTED: [ ][ ]: AM [ ][ ]: PM
(Punch hour only)

TIME ENDED: _____ AM _____ PM

LENGTH OF INTERVIEW: [ ][ ] MINUTES
(punch)

INTERVIEW COMPLETED ON CALL (CIRCLE):

#1 #2 #3 #4 #5
(punch)

INTERVIEWER: _____ CODE# [ ][ ]
(punch)

THIS IS A MASTER COPY THAT INCLUDES ALL QUESTIONS FROM ALL FORMS USED IN THE TELEPHONE INTERVIEWS:

2 GREENSBURG
3 JOHNSTOWN
4 McKEESPORT
5 PITTSBURGH
7 WILLIAMSPORT
8 BETHEL PARK
9 WILKINSBURG

DIFFERENCES IN THE FORMS (OTHER THAN THE CHANGE OF CITY) ARE NOTED IN THIS TYPEFACE.

SEX (CIRCLE): 1 MALE
2 FEMALE

Hello, my name is _____ and I'm calling from Opinion Research Corporation in Princeton, New Jersey. We are doing a survey in a number of communities in Pennsylvania about local and national issues. Your phone number was picked at random and I'd like to get your opinions.

First of all, do you live within the city limits (boundaries) of Greensburg?

1 YES → GO TO Q. 1
2 NO
9 DON'T KNOW → TERMINATE

* * * * *

1. In general, how interested would you say you are in current affairs in the city of Greensburg? Would you say you are very interested, interested, slightly interested, or not interested at all?

1 VERY INTERESTED
2 INTERESTED
3 SLIGHTLY INTERESTED
4 NOT INTERESTED AT ALL
9 DON'T KNOW; NO RESPONSE

2. From what source would you say you get most of your information about current affairs in the city of Greensburg? From talking with people, from newspapers, television, radio, or magazines? (INTERVIEWER: IF MORE THAN ONE SOURCE IS MENTIONED, ASK -- "Can you tell me which one of those is your single most important source of news about Greensburg?")

01 TALKING WITH PEOPLE
02 NEWSPAPERS
03 TELEVISION
04 RADIO
05 MAGAZINES
06 OTHER SOURCE
07 MULTIPLE SOURCES INCLUDING TELEVISION (REFUSES TO CHOOSE ONE MAIN SOURCE)
08 MULTIPLE SOURCES EXCLUDING TELEVISION (REFUSES TO CHOOSE ONE MAIN SOURCE)
09 NONE; PAYS NO ATTENTION TO LOCAL AFFAIRS
99 DON'T KNOW; NO RESPONSE

--2

Q.2A ASKED ONLY IN GREENSBURG-2, McKEESPORT-4, BETHEL PARK-8, AND WILKINSBURG-9

2A. How would you compare your interest in Greensburg news with your interest in Pittsburgh news? Would you say your interest in Greensburg news is more, about the same, or less than your interest in Pittsburgh news?

1 MORE INTEREST IN GREENSBURG NEWS THAN IN PITTSBURGH NEWS
2 ABOUT THE SAME INTEREST IN GREENSBURG NEWS AND PITTSBURGH NEWS
3 LESS INTEREST IN GREENSBURG NEWS THAN PITTSBURGH NEWS
9 DON'T KNOW; NO RESPONSE

3. One of the things we hope to learn is how people get information about current events. Let's start with television . . .

Do you have a television in your home?

1 YES
2 NO
9 DON'T KNOW → SKIP TO Q. 9

(IF "YES" ON Q. 3, ASK):

4. Do you have cable television?

1 YES
2 NO
9 DON'T KNOW; NO RESPONSE

5. National television news includes CBS News with Cronkite, NBC News with Chancellor, and ABC News with Reasoner. They're shown in the early evening around six-thirty or seven, five days a week Monday through Friday. In a typical week, how many evenings do you get a chance to watch Cronkite, Chancellor, or Reasoner -- if any at all? (INTERVIEWER: IF R. IS UNCERTAIN, SAY -- "Just give us a general idea of the number of times." IF R. SAYS TWO NUMBERS -- e.g., "3 or 4 times a week" -- CIRCLE THE LOWER OF THE TWO. IF R. SEES NEWS LESS THAN ONCE A WEEK, PROBE TO FIND OUT WHETHER R. OCCASIONALLY OR NEVER WATCHES -- "Then, if you watch less than once a week, would you say you only occasionally watch or never watch?")

1 ONE EVENING A WEEK
2 TWO
3 THREE
4 FOUR
5 FIVE; EVERY DAY OF THE WEEK
6 LESS THAN ONCE A WEEK; OCCASIONALLY
7 NEVER
9 DON'T KNOW; NO RESPONSE

(Greensburg) --3

(CONTINUATION OF EXCLUSION SEQUENCE FOR THOSE ANSWERING "YES" ON Q. 3)

6. Local TV stations have their own local and regional news along with the weather and sports. This local news is broadcast in the early evening around 6 o'clock and again in the late evening at 11 o'clock, seven days a week. In a typical week, how many evenings do you get a chance to watch a broadcast of the local news -- if any at all? (INTERVIEWER: INSTRUCTIONS FOR Q. 5 ALSO APPLY HERE.)

01 ONE EVENING A WEEK
02 TWO
03 THREE
04 FOUR
05 FIVE
06 SIX
07 SEVEN -- EVERY DAY OF THE WEEK
08 LESS THAN ONCE A WEEK; OCCASIONALLY
09 NEVER
99 DON'T KNOW; NO RESPONSE → SKIP TO Q. 9

(IF RESPONSE 1-8 ON Q. 6, ASK):

7. Do you usually watch the local news around 6 p.m. or the local news at 11 p.m. or do you usually watch both broadcasts?

1 ONLY WATCH AROUND 6 P.M.
2 "MOSTLY" WATCH AROUND 6 P.M.
3 ONLY WATCH AT 11 P.M.
4 "MOSTLY" WATCH AT 11 P.M.
5 USUALLY WATCH BOTH
9 DON'T KNOW; NO RESPONSE

8. Which station or stations do you watch most often for the local news? (INTERVIEWER: DO NOT PROBE FOR ADDITIONAL MENTIONS, BUT CODE UP TO TWO. IF THREE OR MORE, ONLY CIRCLE 88 IN "FIRST MENTION" COLUMN. WE MUST AVOID CONFUSING CABLE CHANNEL NUMBERS WITH ASSIGNED STATION CHANNELS. HERE, IF ANY NUMBER IN THE CABLE CHANNEL COLUMN IS MENTIONED, CHECK TO CONFIRM ITS ASSIGNED CHANNEL. FOR EXAMPLE, IF R. MENTIONS CHANNEL 7, SAY-- "Is that cable channel 7, WTAJ out of Altoona and Johnstown, or is it channel 7, WTRF out of Wheeling?" -- THEN CIRCLE THE ASSIGNED CHANNEL NUMBER.)

ASSIGNED CHANNELS	FIRST MENTION		SECOND MENTION			CABLE CHANNELS	
	02	KDKA	02	KDKA	Pittsburgh		(CBS)
	04	WTAE	04	WTAE	Pittsburgh	3	(ABC)
	06	WJAC	06	WJAC	Johnstown		(NBC)
	10	WTAJ	10	WTAJ	Altoona-Johnstown	7	(CBS)
	11	WIIC	11	WIIC	Pittsburgh	12	(NBC)
	38	WOPC	38	WOPC	Altoona		(ABC)
	07	WTRF	07	WTRF	Wheeling, WV		(ABC/NBC)
	08	WGAL	08	WGAL	Lancaster		(NBC)
	09	WSTV	09	WSTV	Steubenville, OH		(ABC/CBS)
	15	WLYH	15	WLYH	Lancaster		(CBS)
	19	WJNL	19	WJNL	Johnstown		(CBS)
	53	WPGH	53	WPGH	Pittsburgh	10	(ind)
	77	OTHER	77	OTHER STATION(S) MENTIONED NOT LISTED ABOVE			
	88	----------	WATCHES VARIOUS STATIONS; SWITCHES AROUND				
			98	NO SECOND MENTION			
	99	----------	DON'T KNOW; NO RESPONSE				

--4

9. How often do you usually hear the news on the radio? Several times a day, once a day, two or three times a week, once a week or less, or never?

1 SEVERAL TIMES A DAY
2 ONCE A DAY
3 TWO OR THREE TIMES A WEEK
4 ONCE A WEEK OR LESS
5 NEVER
9 DON'T KNOW; NO RESPONSE

10. Let's talk now about newspapers.

In a typical seven day week, how many days would you say you usually get a chance to read a newspaper -- if any at all? (INTERVIEWER: IF R. SAYS TWO NUMBERS -- e.g. "3 or 4 times a week" -- CIRCLE THE LOWER OF THE TWO. IF R. READS PAPER LESS THAN ONCE A WEEK, PROBE -- "Would you say you occasionally or never read the paper?")

01 READ PAPER ONCE A WEEK
02 TWO TIMES
03 THREE TIMES
04 FOUR TIMES
05 FIVE TIMES
06 SIX TIMES
07 SEVEN TIMES -- EVERY DAY
08 LESS THAN ONCE A WEEK; OCCASIONALLY
09 NEVER
99 DON'T KNOW; NO RESPONSE → SKIP TO Q. 12

(IF RESPONSE 1-8 ON Q. 10, ASK):

11. Which newspaper or newspapers do you read? (INTERVIEWER: CODE ONLY THE FIRST THREE RESPONSES.)

FIRST MENTION	SECOND MENTION	THIRD MENTION	
01	01	01	-- PITTSBURGH POST-GAZETTE (morning)
02	02	02	-- PITTSBURGH PRESS (evening or evening plus Sunday)
03	03	03	-- PITTSBURGH PRESS (Sunday only)
04	04	04	-- GREENSBURG TRIBUNE-REVIEW
05	05	05	-- JOHNSTOWN TRIBUNE-DEMOCRAT
06	06	06	-- McKEESPORT DAILY NEWS
07	07	07	-- WILLIAMSPORT SUN-GAZETTE
08	08	08	-- OTHER PENNSYLVANIA DAILY: _____ (Specify)
09	09	09	-- BETHEL PARK BORO NEWS (weekly)
10	10	10	-- NEW PITTSBURGH COURIER (weekly)
11	11	11	-- WILKINSBURG GAZETTE (weekly) IF CIRCLED, ASK 11A, TOP OF NEXT PAGE.
12	12	12	-- OTHER WEEKLY PAPER: _____ (Specify - e.g. "Green Sheet")
13	13	13	-- CHRISTIAN SCIENCE MONITOR
14	14	14	-- NATIONAL OBSERVER
15	15	15	-- NEW YORK TIMES
16	16	16	-- WALL STREET JOURNAL
17	17	17	-- WASHINGTON POST
18	18	18	-- OTHER NATIONAL PAPER: _____ (Specify)
	98		---------- NO SECOND MENTION
		97	-- NO THIRD MENTION
99			---------- DON'T KNOW; NO RESPONSE

Q.11A ALSO ASKED IN BETHEL PARK-8 ABOUT THE BORO NEWS --5

IF "11 - WILKINSBURG GAZETTE" IS CIRCLED ON Q.11, ASK:

11A. When you look at the front page of the Wilkinsburg Gazette, do you usually read most of the stories about Wilkinsburg, only an occasional story about Wilkinsburg, or don't you pay much attention to the news stories?

1 READ MOST OF THE STORIES
2 READ ONLY AN OCCASIONAL STORY
3 DON'T PAY MUCH ATTENTION TO THE NEWS STORIES
9 DON'T KNOW; NO RESPONSE

[11A. IS NOT ASKED IN GREENSBURG. CONTINUE WITH Q. 12.]

12. The next few questions are to help us determine how well public officials have succeeded in getting known in your community.

First, could you give me the name of the Mayor of Greensburg?

1 MAYOR (ROBERT A.) BELL
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

13. Now, could you give me the name of any one of the members of the Greensburg City Council?

1 (JOHN V.) FELICE
(GEORGE S.) RUGH
(RONALD E.) SILVIS
(EDWARD M.) ZIFF
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

14. Next, the City of Greensburg police chief?

1 CHIEF (NICK J.) FICCO, JR.
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

15. The Superintendent of the Greensburg Public Schools?

1 SUPT. (ROBERT) DOVEY
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

15A. Would you happen to know the name of the Mayor of Pittsburgh?

1 MAYOR (PETER) FLAHERTY
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

15B. Now, the Pittsburgh police chief?

1 SUPT. (ROBERT) COLL
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

16. What about the name of the Governor of the State of Pennsylvania?

1 GOVERNOR (MILTON) SHAPP
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

17. Now, the name of Pennsylvania's Lieutenant Governor?

1 LT. GOVERNOR (ERNEST) KLINE
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

18. In the Federal government, could you tell me who is now Chief Justice of the U.S. Supreme Court?

1 CHIEF JUSTICE (WARREN) BURGER
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

--6

19. The name of the current U.S. Secretary of State?

1 SECRETARY (HENRY) KISSINGER
2 ANY OTHER NAME GIVEN
9 NO; DON'T KNOW; NO RESPONSE

20. And now, could you give me the name of the Congressman who represents this district in the U.S House of Representatives in Washington?

1 REP. (JOHN H.) DENT
2 REP. (JOSEPH) GAYDOS
3 REP. (H. JOHN) HEINZ III
4 REP. (WILLIAM S.) MOORHEAD
5 REP. (JOHN P.) MURTHA
6 REP. (HERMAN T.) SCHNEEBELI
7 ANY OTHER NAMES MENTIONED
9 DON'T KNOW; NO RESPONSE

With the following few questions, we hope to find out how often people talk about different subjects.

	Every Day	Once or Twice a Week	Less Than Once a Week	Never	DON'T KNOW; NO RESPONSE
21. For example, how often would you say you talk with family, neighbors, co-workers, and friends about sports? Would you say... (READ CATEGORIES 1-4)	1	2	3	4	9
22. Now, how often would you say you talk with family, neighbors, co-workers, and friends about Greensburg community affairs and politics? (READ CATEGORIES 1-4)	1	2	3	4	9
23. How about community affairs and politics in the City of Pittsburgh? (REPEAT CATEGORIES 1-4 IF NECESSARY)	Q.23 NOT ASKED IN PITTSBURGH-5 1	2	3	4	9
24. Now, how often would you say you talk about area weather? (REPEAT CATEGORIES 1-4 IF NECESSARY)	1	2	3	4	9
25. Next, how often do you talk about the State of Pennsylvania's affairs and politics? (REPEAT CATEGORIES 1-4 IF NECESSARY)	1	2	3	4	9
26. Now, about national affairs and politics? (REPEAT CATEGORIES 1-4 IF NECESSARY)	1	2	3	4	9

27. Now, about organizations and clubs you may belong to, like a community service group, a church group, a union, a lodge, and similar organizations. Are you, yourself, now an active member; that is, do you regularly attend the meetings and take part in the activities of any such organizations and clubs?

1 YES
2 NO
9 DON'T KNOW; NO RESPONSE → SKIP TO Q. 31

(IF "YES" ON Q. 27, ASK):

28. In how many such groups and organizations are you an active member?
1 ONE
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN
8 EIGHT OR MORE
9 DON'T KNOW; NO RESPONSE

29. Overall, how often is there discussion of public affairs and politics at any of the meetings of the (these) organization(s) you belong to? Would you say public affairs and politics are discussed often, sometimes, rarely, or never?
1 OFTEN DISCUSSED
2 SOMETIMES
3 RARELY
4 NEVER
9 DON'T KNOW; NO RESPONSE → SKIP TO Q. 31

(IF "OFTEN," "SOMETIMES," OR "RARELY" ON Q. 29, ASK):

30. What is usually the subject of these discussions -- the nation, the State of Pennsylvania, Greensburg or some other place such as Pittsburgh? (INTERVIEWER: MULTIPLE RESPONSE PERMITTED.)
1 THE NATION (WORLD, TOO)
2 PENNSYLVANIA
3 GREENSBURG (LOCAL SCHOOLS AND COUNTY, TOO)
4 PITTSBURGH
5 OTHER PLACE(S)
9 DON'T KNOW; NO RESPONSE

31. Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?
1 REPUBLICAN
2 DEMOCRAT
3 INDEPENDENT → GO TO Q. 33
4 OTHER
9 DON'T KNOW; NO RESPONSE → SKIP TO Q. 34

(IF "REPUBLICAN" OR "DEMOCRAT" ON Q. 31, ASK):

32. Would you call yourself a strong (Republican) (Democrat) or not a very strong (Republican) (Democrat)?
1 STRONG (REPUBLICAN) (DEMOCRAT)
2 NOT VERY STRONG (REPUBLICAN) (DEMOCRAT)
9 DON'T KNOW; NO RESPONSE

(IF "INDEPENDENT" ON Q. 31, ASK):

33. Do you think of yourself as closer to the Republican or Democratic party?
1 CLOSER TO REPUBLICAN PARTY
2 CLOSER TO DEMOCRATIC PARTY
3 NEITHER
9 DON'T KNOW; NO RESPONSE

--8

Now I'm going to read a few statements about how some people feel about keeping up with the news. We'd like you to tell us if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each statement. The first statement is . . .

	Strongly Agree	Somewhat Agree	DON'T KNOW	Somewhat Disagree	Strongly Disagree	REFUSE TO SAY
34. My friends pay a lot of attention to the news. Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?	1	2	3	4	5	9
35. It is more trouble than it's worth to stay well-informed about current events all the time. (REPEAT CATEGORIES IF NECESSARY)	1	2	3	4	5	9
36. It bothers me when people talk about something in the news that I haven't heard or read anything about. (REPEAT CATEGORIES IF NECESSARY)	1	2	3	4	5	9
37. Sometimes politics and government seems so complicated that a person like me can't really understand what's going on. (REPEAT CATEGORIES IF NECESSARY)	1	2	3	4	5	9
38. I feel guilty when I get too busy to read the paper or watch the television news. (REPEAT CATEGORIES IF NECESSARY)	1	2	3	4	5	9

39. From what source would you say you get most of your information about national affairs and politics? From talking with people, from newspapers, television, radio, or magazines? (INTERVIEWER: IF MORE THAN ONE SOURCE IS MENTIONED, ASK -- "Can you tell me which one of those is your single most important source of news about the nation?)

01 TALKING WITH PEOPLE
02 NEWSPAPERS
03 TELEVISION
04 RADIO
05 MAGAZINES
06 OTHER SOURCE
07 MULTIPLE SOURCES INCLUDING TELEVISION (REFUSES TO CHOOSE ONE MAIN SOURCE)
08 MULTIPLE SOURCES EXCLUDING TELEVISION (REFUSES TO CHOOSE ONE MAIN SOURCE)
09 NONE; PAYS NO ATTENTION TO NATIONAL AFFAIRS
99 DON'T KNOW; NO RESPONSE

40. Which one of these kinds of public affairs do you follow most closely -- national, state, or local affairs? (INTERVIEWER: IF MORE THAN ONE KIND IS MENTIONED, ASK -- "Can you tell me which one kind you follow most closely?" IF R. STILL FAILS TO PROVIDE A SINGLE RESPONSE, CIRCLE THE APPLICABLE MULTIPLE RESPONSE CATEGORY.)

1 NATIONAL
2 STATE
3 LOCAL
4 NATIONAL AND STATE
5 NATIONAL AND LOCAL
6 STATE AND LOCAL
7 ALL THREE EQUALLY
8 NONE; PAYS NO ATTENTION TO POLITICS
9 DON'T KNOW; NO RESPONSE

→ SKIP TO Q. 42

(IF RESPONSE 1-3 ON Q. 40, ASK):

41. Which do you follow least closely -- _____ or _____? (INTERVIEWER: NAME TWO KINDS THAT REMAIN. IF R. FAILS TO GIVE A SINGLE RESPONSE, PROBE -- "Is there no difference?" -- BEFORE CIRCLING THE APPROPRIATE DUAL RESPONSE CATEGORY.)

1 NATIONAL
2 STATE
3 LOCAL
4 NATIONAL AND STATE
5 NATIONAL AND LOCAL
6 STATE AND LOCAL
9 DON'T KNOW; NO RESPONSE

42. In the last election for President in 1972 -- Richard Nixon ran against George McGovern. Did you vote in the 1972 Presidential election or didn't you get a chance to vote?

1 YES, VOTED IN 1972
2 NO, DID NOT VOTE → SKIP TO Q. 43
9 DON'T KNOW; NO RESPONSE

(IF "YES" ON Q. 42, ASK):

42A. Did you vote for Richard Nixon or George McGovern?

Q.42A ASKED ONLY IN BETHEL PARK-8 AND WILKINSBURG-9

1 RICHARD NIXON
2 GEORGE MCGOVERN
3 OTHER CANDIDATE
4 DON'T REMEMBER
9 REFUSE TO SAY

43. The last local election in Bethel Park was last year in November. Did you vote in the 1975 local elections or didn't you get a chance to vote?

1 YES, VOTED IN 1975
2 NO, DID NOT VOTE
9 DON'T KNOW; NO RESPONSE

44. Now how about the election this November? Are you now registered to vote? (IF NO, CONTINUE...) Do you intend to register to vote or will you probably not get a chance to ?

1 YES, REGISTERED TO VOTE
2 INTEND TO REGISTER
3 WILL NO. GET CHANCE TO REGISTER
9 DON'T KNOW; NO RESPONSE

(IF RESPONSE "YES, REGISTERED OR INTEND TO" ON Q. 44, ASK):

45. Who do you think you will vote for in the election for President -- Ford or Carter -- or haven't you decided?

1 FORD; WILL VOTE REPUBLICAN
2 CARTER; WILL VOTE DEMOCRATIC
3 OTHER CANDIDATE
4 UNDECIDED
5 WILL NOT VOTE
9 REFUSE TO SAY

→ SKIP TO Q. 47

(IF "UNDECIDED" ON Q. 45, ASK):

46. If the election were held today, who do you think you would be more likely to vote for -- Ford or Carter?

1 FORD; WILL VOTE REPUBLICAN
2 CARTER; WILL VOTE DEMOCRATIC
3 OTHER CANDIDATE
4 STILL SAY UNDECIDED; NO PREFERENCE
5 WILL NOT VOTE
9 REFUSE TO SAY

--10

47. So far, in the Presidential campaign this year, would you say you have talked with people about the candidates -- Ford or Carter -- often, sometimes, or not at all?

1 OFTEN
2 SOMETIMES
3 NOT AT ALL
9 DON'T KNOW; NO RESPONSE

Now to finish up, I have just a few background questions for statistical purposes.

48. How many years have you lived in Pittsburgh? (INTERVIEWER: IF R. SAYS "ALL MY LIFE," ASK, "How many years is that?" AND THEN ENTER THAT SAME NUMBER IN THE RESPONSE SPACE FOR Q. 49 AND CONTINUE WITH Q. 50.)

_____ YEARS
99 DON'T KNOW; NO RESPONSE

49. What is your age? (INTERVIEWER: IF R. SAYS "DON'T KNOW," ASK, "What's your best guess?" WRITE IN 98 FOR ANYONE WHO IS 98 OR OLDER.)

_____ YEARS
99 REFUSED TO SAY; DON'T KNOW

50. Do you own your home, are you now buying, or do you rent where you are now living?

1 OWN HOME
2 NOW BUYING HOME
3 RENT
9 DON'T KNOW; NO RESPONSE

[50A. IS NOT ASKED IN PHONE INTERVIEW. CONTINUE WITH Q. 50B.]

Q.50B ASKED ONLY IN PITTSBURGH-5

50B. Do you happen to live in or just a few blocks from the neighborhood of West End, Esplen, Corliss, Sheraden, Elliott, Banksville, or Brighton Heights? (INTERVIEWER: IF R. ASKS, "A FEW BLOCKS" MEANS NO MORE THAN ABOUT FOUR OR FIVE BLOCKS.)

1 YES (WEST PITTS)→GO TO Q. 51
No
Don't Know

Do you live in or just a few blocks from the neighborhoods of Hays, Glenwood, Hazelwood, Greenfield, St. Clair, or Carrick?

2 YES (SE PITTS)→GO TO Q. 51
No
Don't Know

(INTERVIEWER: IF "NO" TO BOTH ABOVE, CIRCLE "3 OTHER PITTSBURGH" AND CONTINUE ON TO Q. 51. IF R. HAS SAID "DON'T KNOW" TO ONE OR BOTH ABOVE, THEN CIRCLE "9 DON'T KNOW" AND CONTINUE WITH Q. 51.)

3 OTHER PITTSBURGH
9 DON'T KNOW; NO RESPONSE

51. Do any of the adults in your household work outside of the City of Greensburg say in Pittsburgh, Altoona, or other places?

1 YES, ONE OR MORE IN PITTSBURGH
2 YES, ONE OR MORE IN PITTSBURGH AND OTHER PLACE(S)
3 YES, IN OTHER PLACES BUT NOT PITTSBURGH
4 NO, ALL WORK IN GREENSBURG
5 NO ONE IN HOUSEHOLD IS NOW WORKING → SKIP TO Q. 54
9 DON'T KNOW; NO RESPONSE → SKIP TO Q. 54

(IF RESPONSE 1-4 ON Q. 51, ASK):

52. What is the head of the household's usual occupation?

(INTERVIEWER: WRITE IN OCCUPATION) _____ (ORC WILL CODE) [ ][ ]

53. (INTERVIEWER: IF OCCUPATION IS OBVIOUSLY NOT GOVERNMENTAL DO NOT ASK --) Is that a job with the local, state, or federal government?

1 YES, LOCAL GOVERNMENT JOB
2 YES, STATE JOB
3 YES, FEDERAL CIVILIAN JOB
4 YES, FEDERAL MILITARY JOB
5 NO, NOT GOVERNMENT JOB
9 DON'T KNOW; NO RESPONSE

54. What is the last grade or year that you completed in school?

1 NO SCHOOLING
2 ELEMENTARY SCHOOL - 8TH GRADE OR LESS
3 HIGH SCHOOL INCOMPLETE (9TH, 10TH, 11TH)
4 HIGH SCHOOL GRADUATE
5 ADVANCED VOCATIONAL OR TECHNICAL SCHOOL
6 SOME COLLEGE
7 COLLEGE GRADUATE
8 BEYOND COLLEGE
9 REFUSE TO SAY

55. In addition to being an American, what do you think of as your main ethnic or nationality group, such as Italian, German, Black, or what?

01 BLACK (AFRO-AMERICAN)
02 ENGLISH (& SCOTCH-IRISH)
03 IRISH
04 OTHER NORTHERN EUROPEAN OR MIXTURE (Eng., French, Irish, German, Scan.)
05 ITALIAN
06 EASTERN EUROPEAN OR MIXTURE (Polish, Czech, Hungarian, Russian, Yugoslavian, Romanian, Greek)
07 ORIENTAL; PACIFIC ISLANDER (Chinese, Japanese, etc.)
08 LATIN (Spanish, Portugese, Mexican, Puerto Rican, South American)
09 OTHER (Specify): _____

10 DON'T KNOW; UNDIFFERENTIATED; CAN'T SAY
99 REFUSE TO SAY

--12

56. What is your current marital status? Are you married, widowed, separated, divorced, or were you never married?

1 MARRIED
2 WIDOWED
3 SEPARATED
4 DIVORCED
5 NEVER MARRIED
9 NO RESPONSE

57. How many children 17 years old or younger are living in your household?

1 ONE
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN OR MORE
8 NONE
9 DON'T KNOW; NO RESPONSE

58. Including yourself, how many adults 18 years or over live in your household?

1 ONE → GO TO Q. 60
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN
8 EIGHT OR MORE
9 DON'T KNOW; NO RESPONSE

(IF "TWO" OR MORE ON Q. 58, ASK):

59. Which of these describes you in your household? (INTERVIEWER: FOR A FEMALE RESPONDENT, ONLY READ CATEGORIES 1, 3, 5, 7 AND 8. FOR A MALE, ONLY READ 2, 4, 6, 7, AND 8.)

1 Wife or female head of household
2 Husband or male head of household
3 Daughter of head of household
4 Son of head of household
5 Mother (or in-law) of head of household
6 Father (or in-law) of head of household
7 Some other family relationship, or
8 No family relationship
9 REFUSED TO SAY

60. We have four large categories of annual family income, A, B, C, and D. We would like you to estimate which of the following categories you and your immediate family would be in before taxes in 1975... (READ CATEGORIES 1-4)

1 Group A - Under $10,000
2 Group B - Between $10,000 and $15,000
3 Group C - Between $15,000 and $20,000, or
4 Group D - Over $20,000
5 DON'T KNOW
9 REFUSE TO SAY

That concludes our interview. Thank you very much.

**********DO NOT ASK**********

61. INTERVIEWER: PLEASE ESTIMATE THE RESPONDENT'S UNDERSTANDING OF THE INTERVIEW.

1 NO DIFFICULTY
2 JUST A LITTLE DIFFICULTY
3 A FAIR AMOUNT OF DIFFICULTY
4 EXTREME DIFFICULTY

BIBLIOGRAPHY: TELEPHONE SURVEY METHODS

Assael, Henry, "Comparison of Brand Share Data by Three Reporting Systems," *Journal of Marketing Research*, Vol. 4, November 1967, pp. 400-401.

Bennett, Catherine T., "A Telephone Interview: A Method for Conducting a Follow-Up Study," *Mental Hygiene*, Vol. 45, April 1961, pp. 216-220.

Blankenship, A. B. "Listed versus Unlisted Numbers in Telephone Survey Samples," *Journal of Advertising Research*, Vol. 17, February 1977, pp. 39-46.

Brunner, James A. and Allen G. Brunner, "Are Voluntarily Unlisted Telephone Subscribers Really Different?" *Journal of Marketing Research*, Vol. 8, February 1971, pp. 121-124.

Cahalan, Don, "Measuring Newspaper Readerhip by Telephone: Two Comparisons with Face-to-Face Interviews," *Journal of Advertising Research*, Vol. 1, December 1960, pp. 1-6.

Colombotos, John, "The Effects of Personal vs. Telephone Interviews on Socially Acceptable Responses," *Public Opinion Quarterly*, Vol. 29, Fall 1965, pp. 457-458.

——, "Personal Versus Telephone Interviews: Effect on Responses," *Public Health Reports*, Vol. 84, September 1964, pp. 773-782.

Coombs, Lolagene and Ronald Freedman, "Use of Telephone Interviews in a Longitudinal Fertility Study," *Public Opinion Quarterly*, Vol. 28, Spring 1964, pp. 112-117.

Cooper, Sanford L, "Random Sampling by Telephone—An Improved Method," *Journal of Marketing Research*, Vol. 1, November 1964, pp. 45-48.

Dillman, Don A., *Mail and Telephone Data Collection Methods*, Wiley-Interscience, New York, forthcoming.

Dillman, Don A., Jean Gorton Gallegos, and James H. Frey, "Reducing Refusal Rates for Telephone Interviews," *Public Opinion Quarterly*, Vol. 40, Spring 1976, pp. 66-78.

Eastlack, J. O., Jr. and Henry Assael, "Better Telephone Surveys Through Centralized Interviewing," *Journal of Advertising Research*, Vol. 6, March 1966, pp. 2-7.

Falthzik, Alfred M., "When to Make Telephone Interviews," *Journal of Marketing Research*, Vol. 9, November 1972, pp. 451-452.

Fry, Hilary G. and Sylvia McNair, "Data Gathering by Long Distance Telephone," *Public Health Reports*, Vol. 73, September 1958, pp. 831-835.

Glasser, Gerald J. and Gale D. Metzger, "Random-Digit Dialing as a Method of Telephone Sampling," *Journal of Marketing Research*, Vol. 9, February 1972, pp. 59-64.

——, "National Estimates of Nonlisted Telephone Households and Their Characteristics," *Journal of Marketing Research*, Vol. 12, August 1975, pp. 359-361.

Groves, Robert M., "A Comparison of National Telephone and Personal Interview Surveys: Some Response and Nonresponse Differences," a paper presented at the 1977 meeting of the American Association of Public Opinion Research.

Hauck, Matthew and Michael Cox, "Locating a Sample by Random Digit Dialing," *Public Opinion Quarterly*, Vol. 38, Summer 1974, pp. 253-260.

Hochstim, Joseph R., "A Critical Comparison of Three Strategies of Collecting Data from Households," *American Statistical Association Journal*, Vol. 62, September 1967, pp. 976-989.

Josephson, Eric, "Screening for Visual Impairment," *Public Health Reports*, Vol. 80, January 1965, pp. 47-54.

Judd, Robert C., "Telephone Usage and Survey Research," *Journal of Advertising Reseach*, Vol. 6, December 1966, pp. 38-39.

Kegeles, S. Stephen, Clinton F. Fink, and John P. Kirscht, "Interviewing a National Sample by Long-Distance Telephone," *Public Opinion Quarterly*, Vol. 33, Fall 1969, pp. 412-419.

Kildegaard, Ingrid C., "Telephone Trends," *Journal of Advertising Research*, Vol. 6, June 1966, pp. 56-60.

Klecka, William R. and Alfred J. Tuchfarber, "The Efficacy of Random-Digit Dialing," *Survey Research*, Vol. 15, No. 1, January 1973, pp. 14-15.

Larsen, Otto N. "The Comparative Validity of Telephone and Face-to-Face Interviews in the Measurement of Message Diffusion From Leaflets," *American Sociological Review*, Vol. 17, August 1952, pp. 471-476.

Leuthold, David A. and Raymond Scheele, "Patterns of Bias in Samples Based on Telephone Directories," *Public Opinion Quarterly*, Vol. 35, Summer 1971, pp. 249-257.

Locander, William B., Seymour Sudman and Norman Bradburn, "An Investigation of Interview Method, Threat and Response Distortion," *Journal of the American Statistical Association*, Vol. 71, June 1976, pp. 269-275.

Locander, William B. and John P. Burton, "The Effect of Question Form on Gathering Income Data by Telephone," *Journal of Marketing Research*, Vol. 13, May 1976, pp. 189-192.

Mooney, H. William, Beatrice Pollack, and Leslie Corsa, Jr., "Use of Telephone Interviewing to Study Human Reproduction," *Public Health Reports*, Vol. 83, December 1968, pp. 1049-1060.

Myers, George C., "The Elusive Male: Some Methodological Notes on Survey Research Design," *Public Opinion Quarterly*, Vol. 38, Summer 1969, pp. 254-259.

Oakes, Ralph H., "Differences in Responsiveness in Telephone Versus Personal Interviews," *Journal of Marketing*, Vol. 19, October 1954, p. 169.

Paisley, William J. and Edwin B. Parker, "A Computer-Generated Sampling Table for Selecting Respondents Within Households," *Public Opinion Quarterly*, Vol. 29, Fall 1965, pp. 431-436.

Payne, Stanley L., "Some Advantages of Telephone Surveys," *Journal of Marketing*, Vol. 20, January 1956, pp. 278-281.

Perry, Joseph B. Jr., "A Note on the Use of Telephone Directories as a Sample Source," *Public Opinion Quarterly*, Vol. 32, Winter 1968-69, pp. 691-695.

Rogers, Theresa F. "Interviews by Telephone and in Person: Quality of Responses and Field Performance," *Public Opinion Quarterly*, Vol. 40, Spring 1976, pp. 51-65.

Roslow, Sydney and Laurence Roslow, "Unlisted Phone Subscribers are Different," *Journal of Advertising Research*, Vol. 7, August 1972, pp. 35-38.

Schmiedeskamp, Jay W., "Reinterviews by Telephone," *Journal of Marketing*, Vol. 26, January 1962, pp. 28-34.

Stock, J. Stevens, "How to Improve Samples Based on Telephone Listings," *Journal of Advertising Research*, Vol. 2, September 1962, pp. 50-51.

Sudman, Seymour, "The Uses of Telephone Directories for Survey Sampling," *Journal of Marketing Research*, Vol. 10, May 1973, pp. 204-207.

——, "New Uses of Telephone Methods in Survey Research," *Journal of Marketing Research*, Vol. 3, May 1966, pp. 163-167.

——, *Applied Sampling*, New York, Academic Press, 1976.

Tigert, Douglas J.; James G. Barnes, and Jacques C. Bourgeois, "Research on Reseach: Mail Panel Versus Telephone Survey in Retail Image Analysis", *The Canadian Marketer*, Winter 1975, pp. 22-27.

Troldahl, Verling C. and Roy E. Carter, Jr., "Random Selection of Respondents Within Households in Phone Surveys," *Journal of Marketing Research*, Vol. 1, May 1964, pp. 71-76.

Tuchfarber, Alfred J. and William R. Klecka, *Random Digit Dialing: Lowering the Cost of Victimization Surveys*, Police Foundation, Washington, D.C., 1976.

U. S. Census Bureau, "Characteristics of Households with Telephones, March 1965," *Current Population Reports*, Series P-20, No. 146, December 1965.

Weller, Tom, "Telephone Interviewing Procedures," *Survey Research*, Vol. 5, No. 1, January 1973, pp. 13-14.

Wheatley, John J., "Self-Administered Written Questionnaires or Telephone Interviews?" *Journal of Marketing Research*, Vol. 10, February 1973, pp. 94-96.